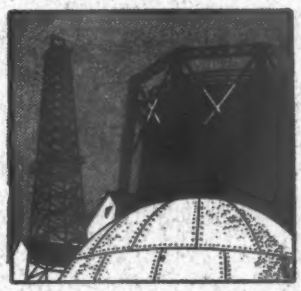
# AMERICAN GAS ASSOCIATION MONTHLY



The Viewpoint of the Manufacturer
E. S. DICKEY

A. G. A. Endows Fellowships at Two Universities

Natural Gas Men Favor Conservation
KEITH CLEVENGER

P. H. Gadsden Reviews Gas Industry—Past and Future

One Million Opportunities
J. DAVID HOUSER

Domestic Gas Appliance Course at Laboratory

Henry L. Doherty Awarded Walton Clark Medal for Achievement

*June, 1930*

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The Association does not hold itself responsible for statements and opinions contained in papers and discussions appearing herein.



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# OUR OWN WHO'S WHO

LXI

Samuel E. Mulholland

SAMUEL E. MULHOLLAND, vice-president of the Northern Indiana Public Service Company, and an officer and director of other public utility companies in Indiana under the management of Samuel Insull and associates, has been identified with the gas industry for thirty-five years. He was a pioneer in the development of gas transmission lines. Born in Logansport in 1866, he graduated from the local high school. In 1895 he joined the Dietrich Gas Syndicate as chief accountant. Later, he took charge of the Ohio office of the syndicate, after which he went to South Bend in charge of the street railway system of that city. In 1908 he moved to Fort Wayne as acting general manager of the Indiana Lighting Company, and local manager of Fort Wayne. In 1916, the United Gas Improvement Company purchased the Indiana Lighting Company and joined it with the Northern Indiana Gas and Electric Company, under the latter name, and Mr. Mulholland became vice-president. The corporate name was changed to the Northern Indiana Public Service Company, which has been a subsidiary of the Midland United Company since 1923.

AMERICAN
GAS ASSOCIATION
MONTHLY

VOLUME XII JUNE, 1930 NUMBER 6

# Natural Gas Men Favor Conservation

By Keith Clevenger

Director of Publicity and Advertising
American Gas Association

IN a number of ways the annual convention of the Natural Gas Department, American Gas Association, held in New Orleans, May 5 to 8, was unusual and different from any previous convention of this industry.

In the first place, never in the history of the natural gas business have men representing this industry gathered at one of the four extreme boundaries of the United States. As a rule these meetings have always been held nearly as possible in the center of some one of the several natural gas producing areas of the country.

Secondly, never in the history of the natural gas business has a convention of the industry been held in such an unusual and romantic setting as was this convention at New Orleans.

Likewise, probably seldom, if ever in the history of the industry, has such open hearted hospitality and unstinted efforts to entertain and please ever been evinced by a host company as was indulged upon the 850 delegates and their wives during this convention.

Beginning with the entertaining and instructive boat ride on the Steamer *Capitol* over the points of interest in the harbor of this, the second largest port of the United States, Monday afternoon, May 5, to the closing program of inspiring negro spirituals, Wednesday evening, May 7, in the entrancing *patio* of the Little Theater—*Le Petit Theater du Vieux Carre*—in St. Peter Street, the scene of southern hospitality and charming femininity, bathed in an atmosphere of blue moonlight, every step in the program of entertainment of both the men and women visitors seemed to excel all previous experiences.

### *Conservation Unanimously Endorsed*

The convention unanimously endorsed a resolution presented Thursday morning, May 8, urging a study by the main Technical and Research Committee of the American Gas Association, cooperating with the United States Bureau of Mines and such other interested agencies, of the subject of natural gas conservation, and report a definite plan for the further prosecution of this work at the meeting of the Natural Gas Department in Atlantic City in October, this year.

A nominating committee consisting of N. C. McGowen, chairman, J. D. Creveling and A. W. Leonard, was appointed to select officers for the Natural Gas Department for action at the annual meeting of the American Gas Association in Atlantic City, this fall.

It was also the decision of the managing committee of the department to recommend a fall sales conference for natural gas companies somewhere in the Southwest this fall, and that a joint convention of the Natural Gas Department and the Southwest Division Natural Gas Department be held somewhere in the Southwest in the spring of 1931.

"Natural Gas, America's Newest Giant?" and "where is it going," were both the text and the all-absorbing question on the tongues of the 850 delegates who attended the convention.

In his opening remarks to the convention under the foregoing title, B. J. Mullaney, president of the American Gas Association, sounded a note of warning that the natural gas industry profit from the experiences of the manufactured gas industry, appreciate its opportunity for service, its opportunity for sales development, for efficient management, hence its opportunity for business at a profit that would insure its continued growth and usefulness.

"Load factor is the greatest single element in the economics of long-distance gas transportation," said Mr. Mullaney, "and load factor brings up all the details of marketing, from utilization on one hand and rate making on the other, to personal salesmanship in disposing of the product and personal service to customer-users."

In his annual report to the convention, H. C. Morris, chairman of the Natural Gas Department, paid tribute to the exhaustive work for the industry that is being carried on by the American Gas Association in the various sections and the numerous committees, all studying and contributing to the improvement of the gas business, both natural and manufactured, in its many production, transportation, distribution and utilization activities.

### *Increased Funds for Research*

Among other matters Mr. Morris suggested for action of the convention was the appointment of a committee of the Natural Gas Department to study the subject of house cooling by gas and to make recommendations to

the annual meeting in Atlantic City, relative to the extent of the program to be attempted, the fund necessary for the proper prosecution of the study, and the increase in natural gas dues needed to successfully institute this and other research problems effecting the natural gas industry.

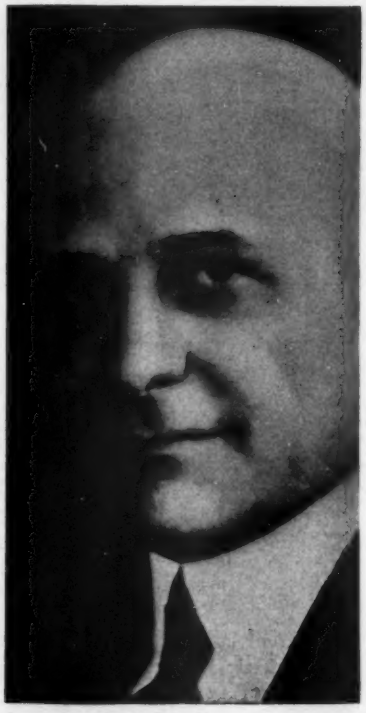
Mr. Morris further said:

"Here in this cradle of American history, this interesting city of historic romance and modern commerce, we are not unmindful of the compliment which New Orleans has paid to the natural gas industry by inviting this Association to spend a few days as its guest. New Orleans in a way is symbolical of the gas industry itself, for the history of the gas business in this city synchronizes both in time and in progress with the history of the entire industry.

"This metropolis reaches far into the past with its memories and reminiscenses and also is a city of the present and the future. Likewise our own business has its beginnings far back in history, but also is most peculiarly modern in its present-day activities and in its future expectations.

"When people were just beginning to think about using gas, New Orleans erected one of the first gas plants in America, and for 93 years used this oldest of public utilities. Its change to natural gas a few years ago, after almost a century with the artificial product, is representative of what has occurred over large sections of our country in the past decade. This leads us naturally to a consideration of the tremendous growth of natural gas within the last few years; and perhaps there is no better spot in the country from which to review these changes than this same interesting city which geographically is so close to the very heart of this development.

"Here we find ourselves surrounded by the most remarkable natural gas development in the history of the world. In the Southwest, manufactured gas plants have almost entirely disappeared; the markets comparatively close to the gas fields long since have been taken over by our branch of the industry, and now we see pushing out in every direction from the centers of supply, long gas lines whose size and length were unthought of ten or even five years ago.



*H. C. Morris*

"What has happened in Louisiana is very representative of what is going on all over the natural gas territory. In a single year's time four pipe lines of major proportions were constructed from this state, and three of these lines will serve consumers in nine states. These lines include the Memphis Natural Gas Company line from the Monroe, Louisiana, field to Memphis, Tenn., which was completed in December, 1928. The next was the Arkansas Pipe Line Company's 20 inch line, 125 miles long, from the Monroe and Richland, La., fields to a point on the Louisiana-Texas boundary. This line was completed in November, 1929. The next was the Mississippi River Fuel Corporation 22 inch line to the St. Louis district, and the fourth was the Southern Natural Gas Corporation 20 inch line to Birmingham, Ala., and Atlanta, Ga. This is only a portion of the construction activities of recent months. Time does not permit us to dwell in detail on this phase of our expansion, but I should like to touch the high spots in order to give the proper background for our discussion.

"Among the important cities to which natural gas has been carried or soon will be carried, are Chicago, San Francisco, Salt Lake City, St. Louis, Atlanta, Birmingham, Council Bluffs, Iowa, Lincoln, Neb., and a score or more of other cities in the Middle West. For the first time a long distance line crossed the Mexican border when the United Gas Company laid a 12 inch pipe, 143 miles long, from fields near Laredo, Texas, to Monterey, Mexico. The Arkansas-Louisiana Pipe Line Company constructed 136 miles of 8 and 6 inch pipe from Oil City, La., to serve 12 towns in northeastern Texas. The Lone Star Gas Company built a 125 mile line of 20 inch pipe from Petrolia, Texas, to Fort Worth and Dallas, Texas. The Magnolia Gas Company started construction of a 230 mile line from Webb County, Texas, to San Antonio. The El Paso Natural Gas Company constructed approximately 200 miles of line from Lea County, New Mexico, to El Paso, Texas. The Western Public Service Corporation constructed about 345 miles of gathering, transporting and distributing lines to serve 13 cities in Utah, including Salt Lake City and Ogden, and several communities in southwestern Wyoming. The Pacific Gas and Electric Company constructed 328 miles of line from the Kettleman Hills area in California to San Francisco and other California cities.

"Among the more important lines projected for 1930 are the 900 mile line from the Texas Panhandle to Chicago; a line of about the same length from the Panhandle to Lincoln, Nebraska; Council Bluffs, Iowa, and a dozen other cities in these two states; the line which will carry natural gas to Albuqerque, New Mexico; a line to Greely, Colorado; one from the Wyoming gas fields to Buffalo and Sheridan, Wyoming; extensions of the lines from the Turner Valley field in Canada to the Big Horn basin in Wyoming, and lines to Bismarck and Williston, North Dakota; a second large and important line from the Kettleman Hills to the San Francisco Bay area and the lines in Canada which will supply Moose Jaw and Regina in Saskatchewan and Winnipeg in Manitoba.

"The Atlantic seaboard is the sole stronghold of industry and population that remains uncaptured by the vigor-

ous advance of our industry. Rumors persist that the day is not far distant when this exception will be removed. With service extended from the Pacific to the Atlantic, from the Gulf to the Canadian border, an industry that a few short years ago was purely local in character will have expanded into one truly national in its scope and in its responsibility for service.

"That the amount of capital involved in such a program of expansion is tremendous can readily be understood by anyone familiar with construction costs. For example, it has been calculated that $100,000,000 of pipe lines has been constructed from one locality—the gas producing areas of northern Louisiana.

"The vast expansion has been made possible largely by reason of the development of extensive gas reserves in Texas, Louisiana, Oklahoma and California. It is familiar to everyone in the gas business and we need not dwell on it further.

"The development of these large gas reserves would not, in itself, provide a substantial basis for the construction of long lines no matter how tempting the terminal markets might be were it not for other contributing factors. Among these is the better understanding that now exists between oil and gas operators, conservation officials and the public generally in reference to the economic necessity of mitigating the waste of natural gas in the fields and in the methods of utilization. But despite the progress that has been made in this direction there is much that remains to be done. In some of the very areas from which several of our largest projects receive their supply, there is still such waste as to shock the conscience of thinking people today.

"The early part of the present decade witnessed the discovery of immense gas reserves in the East, West and South portions of our country and in many cases there was an almost complete dissipation of these reserves with little or no corresponding economic use. The fallacy that gas reserves are inexhaustible was again made manifest.

"In the State of Louisiana, for example, wells in the Caddo field burned for seven or eight years before they were extinguished, and in the interim a gas line was projected to St. Louis by the Busch and Everett interests but was abandoned because of wasting of the gas reserves.

"Deeper drilling is being done today than at any other time in the development of the search for oil and gas. As a result of this deeper drilling, higher well pressures are encountered and the possibility of reaching new producing horizons is increased, but due to improved methods seldom do we hear of a real deep well getting out of control, creating a crater, or dissipating a field. The improvement of drilling machinery, tools and materials, together with the development in the technique of drilling operations has made this possible. Advancements in the art of manufacture of all material used, from the well to the customer's meter, have all contributed to the possibilities of today.

"Despite the existence of waste in particular localities, never before in the history of the industry has the situation with reference to gas reserves been so satisfactory from the standpoint of those who have invested in natural gas pipe line projects. Not only have large supplies been discovered within fairly compact areas but also the ownership or control of these reserves, to a very large extent, has passed into hands whose chief interest lies in their orderly and economical development. This might be contrasted with the hysterical competitive situations that existed only a few years ago.

"It is probable that the construction of each of the long lines that we have previously enumerated has been justified by the extent of the developed reserves from which they now receive their supply, and by the probability that improved drilling methods and geological technique will augment these particular reserves when their ultimate depletion takes place.

"It is no doubt also true that construction of these lines has been predicated upon a careful analysis of the market possibilities of the areas they serve and that they have been built into territories that, if properly developed from the standpoint of their market potentialities, will adequately support their financial structures.

"With these important questions of supply and the adequacy of the market favorably answered, there still remains the coordinate question of complete saturation of the market for present uses, and development of a diversity of use that will properly utilize the capital expenditures required by these projects. Perhaps the most significant fact in reference to these recent developments is the comparatively large amount of fixed capital necessary for adequate service. This is true not only of the recent long line projects that go directly from a given producing area to a terminal market, but it applies with equal force to the older companies that have developed gradually over a long period.

"The day has passed when large deliveries of gas can be made without the assumption of these heavy capital expenditures. What has been said in reference to the fixed capital of these companies is true also in a large measure of a substantial part of their current operating charges. With the exception of the cost of the gas purchased or produced, an increase in the volume of sales develops no corresponding increase in the normal operating charges of a natural gas pipe line company. In an industry that possesses these inherent characteristics the real problem of successful management lies in the development of the maximum utilization of these fixed charges, capital and operating, expressed in terms of maximum sales.

"Just as improved geological and drilling methods have contributed to the discovery and development of large reserves; just as the cooperation between producers and the activities of conservation agencies have contributed to a proper utilization of these reserves; so in a somewhat lesser degree the American Gas Association, through its research efforts directed toward the solution of some of the manifold and perplexing problems of operation and utilization, has contributed to the feasibility of long line construction.

"Among the more important research efforts promoted and directed by the A. G. A. which are of utmost importance to the natural gas industry are the following:

"*Pipe Coatings and Corrosions*—The Association maintains a research fellow, Dr. Scott Ewing, at the Bureau

of Standards, who is devoting his entire time in cooperation with the Bureau, the American Petroleum Institute, Pacific Coast Gas Association, and other interested bodies to the very important study of pipe corrosion and particularly for the present year to the various types of coatings available for the prevention of such corrosion.

"*Pipe Joint Research*—The Association has employed a competent distribution engineer to direct research activities at the A. G. A. Laboratory and at various technical universities. The research proposed is based on discussion and recommendations of distribution engineers at the various Distribution Conferences, and broadly includes study of the performance, not only of old bell and spigot joints, but all new types of joints so far developed.

"*Mixed Gas Research*—This research, conducted at the A. G. A. Laboratory, is of particular interest to natural gas men, as it involves utilization problems in connection with the mixing of natural and manufactured gas.

"*Problems Involved in Changing from Manufactured to Natural Gas Distribution*—This work is of particular interest to natural gas men and consists largely of dissemination of data on successful methods of handling problems involved in distributing dry gas in systems designed for the distribution of a saturated gas. The committee handling this matter is composed largely of natural gas men experienced in such work.

"*Industrial Research*—Through the constructive cooperation of the larger gas companies, the Association is three years on the way in a five-year program of reseach in industrial gas utilization, which has resulted in the development of gas-burning appliances serving to increase our business in the field of industry. This fund, administered by a committee of manufactured and natural gas utilization engineers, has accomplished notable results. It has already developed a traveling gas-fired bake oven, a rotary brass melting retort and a hotel broiler which together command the entire heating loads for these purposes for gas in competition with other fuels.

"In addition to these research activities, the A. G. A. is rendering great aid to the industry through its statistical service, employee education, advertising and publicity, and other departments.

"Natural gas men have been cooperating in the development of these broad services to the members. The old Natural Gas Association, through its Technical and Research Section, issued reports on Standard Meter Connections, Standard Testing for Gasoline Content, Gas Distribution and Gas Utilization. The Natural Gas Department of the American Gas Association has continued the specialized research in natural gas subjects and now has, under its Main Technical and Research Committee, subcommittees on Gas Measurement, Pipe Line Flow and Gas Well Delivery Capacities. The work of these committees has already had an important influence on the growth and extension of the Natural Gas Industry and their good work is continuing. These Committees will give you their reports later in this Convention.

"The Natural Gas Conservation Committee and the new Committee on Federal Taxation are dealing with subjects of very great importance to all of us. Their work is in progress and their conclusions will be made known at a later date.

"We recognize the fact that the members of these Committees and of our Executive Committee, our Managing Committee and our Advisory Committee, as well as the natural gas men who are serving on other Association Committees, are giving voluntarily of their time and their efforts for our Association and for the general advancement of the Industry. For the Natural Gas Department of the Association, I wish to express to these men our grateful acknowledgment.

"I return now to the question of market saturation previously mentioned. During the past winter, attended in many sections by unprecedented cold weather, numerous gas companies were forced to a further realization of a condition in their business already well known, namely the marked difference between the summer and winter demand of the domestic consumer, otherwise called a very poor load factor. For example, the daily demand of the domestic consumer on the coldest winter day is approximately five times his average daily demand and eight to ten times his average daily demand during summer months.

"The improvement of this load factor condition will become more and more necessary and essential to the profitable operation of our long pipe lines as our large now known reservoirs diminish. The mere addition of new business that has the exact characteristics of present business may or may not mean any increased revenue per dollar invested unless excess facilities have already been provided prior to the time of securing this new business. The mere multiplication of the number of domestic consumers, whose annual load factor under present marketing conditions of natural gas will not exceed 20 per cent, is not the problem before this association, nor does it require the talent and technical skill that the men connected with our research department possess.

"As a general proposition the older natural gas companies have quite naturally developed the use of gas for house heating. This, however, is a problem engaging the attention of the manufactured gas companies and also natural gas companies in the cities recently served. We all realize that a Utopian situation in the distribution and sale of natural gas would be to obtain as nearly as possible a 100 per cent annual load factor.

"The present developed uses of natural gas do not afford a summer market in any respect equal to the winter demand. This brings us to the question of what further uses we can find for our product in the household during the summer months. Some progress has been made along this line in the development and the marketing of gas refrigerators, but as the use of gas for this purpose is estimated at not more than five per cent of the demand created by the heating load, obviously we must work in other directions for the answer. Taking inspiration from the use of gas for refrigeration, this suggestion presents itself: If the heating load created our winter peak, why not use gas for summer cooling and in a large measure fill the summer valley?

"Mr. Eugene D. Milener, the industrial research representative of the American Gas Association, very aptly

(Continued on page 264)

# A. G. A. Endows Fellowships at Two Universities

THE Report of the Committee on Supply Men's Fund to the Natural Gas Department Convention at New Orleans, Louisiana on May 6, announced that the American Gas Association has endowed two fellowships in natural gas research, one at University of West Virginia and the other at Oklahoma University. The report follows:

"When the Natural Gas Supply Men, Incorporated, gave up its existence in 1927, invested funds amounting to $17,000 were turned over to the American Gas Association with the stipulation that the income would be used for educational purposes. The old Natural Gas Association of America had funds amounting to $10,000 invested in Liberty Loan Bonds and these were also turned over to this Association to be used as determined by the Natural Gas Department. The Committee on Natural Gas Supply Men's Fund was appointed by action of the Executive Board June 1, 1928. This Committee was charged with the responsibility of determining the best means of applying the available income to educational purposes.

"Your Committee has had several meetings and has corresponded at length with various schools in different parts of the country. We have sought the advice of college presidents, university graduates and plain gas men. We have considered undergraduate aid and post-graduate research. We have studied the advantages of scholarships, loan funds and fellowships. We have investigated the facilities, the curricula, the staff and the interest shown by colleges and universities. As a result, we have arrived at certain definite conclusions.

"The natural gas industry is in need of technical graduates who have studied those subjects most applicable to the problems of our industry and who have had some experience or contact with our operations. Our universities, generally speaking, lack the funds required to promote research into natural gas subjects or to aid those worthy students who would like to spend more time in natural gas research but who cannot afford to invest more of their own money in further study and research after their graduation. Our educational fund fits happily into this picture.

"While we are of the opinion that the greatest good can be accomplished by graduate aid through research fellowships, it may be necessary to give assistance to worthy Juniors and Seniors which will help them to graduate from the regular engineering courses and to then undertake the special research work.

"In order to obtain the greatest and most effective results, we have agreed that the distribution of our funds should be limited to two schools, preferably representing two distinct sections of the country.

"After making our complete study of this subject, we have selected the University of Oklahoma to represent the Western section and the University of West Virginia to represent the Eastern section. The income allotted to each school will be applied in that school as determined by consultation between the school and the committee. The school will submit a list of recommended students each year, giving the detailed experiences and qualifications in each case, and the selection of the student or students to receive aid will be made by this Committee. Whether such aid will be in the nature of an undergraduate loan or a post-graduate fellowship will depend upon the merits of the various cases submitted each year.

"The advances made to undergraduates will be considered as loans to be repaid by the student after graduation unless the student to whom the loan was made completes a satisfactory amount of post-graduate or fellowship work.

"When used for post-graduate or fellowship work no repayment will be expected if a satisfactory amount of post-graduate work is done.

"It is expected that the plan can be put into operation at the beginning of the next school year.

"In presenting this report, your Committee feels certain that a very meritorious procedure has been developed along the lines desired by the donors of the Fund which will aid worthy students who are so inclined to pursue studies of definite subjects which will be helpful to our industry and which will aid the schools themselves in giving more attention to natural gas subjects so that the students, the schools and our industry will all benefit.

"J. D. Creveling
"S. W. Meals
"J. B. Tonkin, Chairman."

## Wins McCarter Medal

*R. W. Alexander*

The McCarter Medal of the American Gas Association, the award for resuscitation by the prone pressure method, was presented to Robert William Alexander, engineering assistant of The Union Gas and Electric Company, Cincinnati, Ohio, on April 18 before a gathering of employees of all departments. He saved the life of Charles J. Webb, gas complaint man, of Newport, Ky.

Webb was overcome by gas on December 2, 1929, while he and Alexander and laborers were repairing a gas leak at a packing company plant. Alexander applied the prone pressure method of artificial respiration, and in about five minutes Webb regained consciousness. He was taken to a hospital and pronounced recovered the next day.

# A. G. A. Sends Three to Attend World Power Parley

OFFICIAL delegates to the World Power Conference, which will take place in Berlin, Germany, June 16-25, will include three representatives of the American Gas Association —Arthur M. Apmann and J. S. S. Richardson, of New York, and C. J. Ramsburg, of Pittsburgh.

The United States will be one of the leading participants in the Power Conference, which will call together engineers, economists, chiefs of industry, agricultural experts and specialists in education from forty-nine countries. The Conference will be held for the interchange of world views on the use and development of power and discussion of methods by which the power resources of the world may be utilized more completely for the benefit of mankind.

Leaders in science, finance and manufacture aboard, as well as rulers and heads of governments are ranging themselves in cooperation with a large German sponsoring committee now making arrangements for the international meeting. Officially known as the Second Plenary World Power Conference, the meeting will bring together the largest group of power science savants ever assembled in the history of the world. The gathering has the personal patronage of President Paul von Hindenburg, head of the German Republic, who acts as official sponsor for the meeting. The Honorary President of the Conference is His Excellency Geheimer Baurat, Dr. Ing. E. h. C. von Miller and the chairman is Generaldirektor Dr. E. h. C. Kottgen.

Cooperating with the German sponsoring group is an American Committee, of which Robert P. Lamont, Secretary of Commerce of the United States, is honorary chairman. Honorary vice-chairmen of this group are Patrick J. Hurley, Secretary of War; Ray Lyman Wilbur, Secretary of the Interior; A. M. Hyde, Secretary of Agriculture; William H. Bassett, first vice-president of the American Institute of Mining and Metallurgical Engineers; Owen D. Young, chairman of the board of the General Electric Company; A. W. Robertson, chairman of the board of the Westinghouse Electric and Manufacturing Company; Matthew S. Sloan, president of the National Electric Light Association; James H. McGraw, chairman of the board of the McGraw-Hill Publishing Company; Sidney Z. Mitchell, chairman of the board of the Electric Bond and Share Company; Samuel Insull, president of the Commonwealth Edison Company of Chicago; George B. Cortelyou, president of The Consolidated Gas Company of New York; Charles Piez, president of the American Society of Mechanical Engineers, and John F. Coleman, president of the American Society of Civil Engineers. The Chairman of the American Committee is O. C. Merrill of Washington, formerly executive secretary of the Federal Power Commisssion. Henry J. Pierce of the Electric Bond and Share Company, New York, is vice-chairman and H. M. Addinsell of Harris, Forbes and Company, New York, is treasurer. Mr. Merrill is Chairman of the Executive Board and Mr. Pierce is vice-chairman. Members of the Board are Mr. Addinsell, Paul S. Clapp, managing director of the National Electric Light Association, Colonel Hugh L. Cooper, engineer and constructor of the great dam over the Dnieper River; Major Alexander Forward, managing director of the American Gas Association; Elwood Meade, commissioner of reclamation of the Department of the Interior; Calvin W. Rice, secretary of the American Society of Mechanical Engineers; David B. Rushmore, formerly of the General Electric Company; George Otis Smith, director of the United States Geological Survey, and Scott Turner, director of the Bureau of Mines.

Nations, dominions and province enrolled as members of the World Power Conference are, in addition to the United States and Germany, the Australian Commonwealth, Austria, Belgium, Brazil, British Guiana, Bulgaria, Canada, Ceylon, Chile, China, Colombia and Czecho-Slovakia. Also Denmark, Dutch East Indies, Esthonia, Finland, France, Gold Coast, Great Britain, Greece and Holland; Hungary, Indian Empire, Ireland, Italy, Japan, Jugo-Slavia, Kenya Colony, Latvia, Lithuania, Luxemburg, Mexico, New Zealand, Norway, Nyasaland, Peru, Poland, Portugal, Roumania, Russia, South Rhodesia, Spain, Sweden, Switzerland and the Union of South Africa.

Organizations associated in the American Committee are the American Electrochemical Society, American Institute of Consulting Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Gas Association, National Electric Light Association, National Coal Association, the Forest Service of the United States Department of Agriculture, the Bureau of Foreign and Domestic Commerce of the United States Department of Commerce; and Bureau of the Census of the United States Department of Commerce; the Bureau of Mines and the Bureau of Standards, also of the United States Department of Commerce; the Bureau of Reclamation of the United States Department of the Interior and the Geological Survey, also of that Federal department; the Corps of Engineers of the United States Army and the Federal Power Commission.

The American Gas Association is contributing to the Conference papers on the economic cycle of gaseous fuel, on the extension of gas service and the progress of rate making, on coke oven manufacture in relation to the gas industry's advance, and, in conjunction with other organizations, on education of employees, collection of statistics and on modern phases of legislation and regulation.

# A Modern Homes Exposition

By C. D. Williams

Executive Secretary, New England Gas Association

*C. D. Williams*

FROM April 8 to 16, inclusive, in the Boston Madison Square Garden, which occupies the upstairs area of the North Station Terminal of the Boston-Maine Railroad, was held an exposition of the appliance which the modern home must consider.

This exposition was probably the first of its kind in which the gas industry was preeminently represented. In fact, it did not have to take second or even tenth place to its big, smart, electrical brother. Beginnings had already been made at Springfield in the Eastern States Exposition last September and by the reaction so far experienced this effort will be fostered and to an extent standardized, at least in New England.

The organization in this instance proceeded largely from the initiative of a group of appliance manufacturers who bargained with the management for some twenty-seven hundred sq.ft. of exhibition space and pursuaded the metropolitan Boston group of gas companies, eight in number to cooperate by taking the central position of this space which was made into a reception room and information bureau. Around this space were clustered the exhibits of the appliance manufacturers who referred to the gas company personnel in the central space, prospects in their territory.

The cooperative gas exhibit, costing about $2,200 exclusive of the cost of personnel in attendance, was beautifully decorated in the modernistic manner. This exhibit was designed, erected and installed under the auspices of H. J. Walton, sales manager, and H. M. Goodwin, of the Malden & Melrose Gas Light Company. The wicker furniture, floor coverings, and plants were rented for the occasion. In this central space, costumed home service girls, under the direction of the Boston Consolidated Gas Company and the Cambridge Gas Light Company, served Electrolux fruit punch, an unbelievable amount of which was consumed. This feature, however, proved to be the necessary added impetus required to fill the space and an encouraging number of prospects was

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*A Glimpse of Some of the Publicity Covering Exposition*

# P. H. Gadsden Reviews Gas Industry—Past and Future

*P. H. Gadsden*

GAS and electric operating companies are quasi-public corporations and will be regulated by the public either through state commissions, as at present, or by a Federal commission, or by public ownership," Philip H. Gadsden told 300 representatives of gas companies who attended the annual meeting of the Pennsylvania Gas Association at Wernersville, Pa., on April 30. Mr. Gadsden is vice-president of The United Gas Improvement Company, Philadelphia, president of the Philadelphia Chamber of Commerce, and a member of the Advisory Council of the American Gas Association.

"The advocates of government and municipal ownership," he said, "have made little headway in this country for the reason that since the establishment of our government the people of the United States have been committed definitely to the encouragement of individual initiative and private enterprise, and are firmly convinced that this philosophy of government is the basis of our national prosperity.

"The only thing which, in my judgment, would make the general acceptance of public ownership possible would be the breakdown of state regulation. The complete answer to public ownership agitation is effective, courageous, comprehensive regulation by Public Service Commissions. Instead of opposing the establishment of Public Service Commissions with jurisdiction over gas and electric properties in states where they do not exist at present, we should lend our aid to the adoption by such states of comprehensive public service regulation acts. Furthermore, in states where commissions are functioning, we should support all reasonable, well-considered propositions to strengthen the regulatory power of the commissions, to the end that they should have jurisdiction over all factors which enter into the quality and cost of service to the customer.

"The demand for Federal regulation on the one hand, and government ownership on the other, is predicated to a large extent upon the charge that state regulation has fallen down. While it is easy to demonstrate that this is not true, the most convincing way to meet such charges is to strengthen and broaden the regulatory powers of the commissions so as to leave no doubt in the minds of our customers and the public generally that public service commissions are the most effective agencies for the protection of the public interest."

Mr. Gadsden pointed out that the growth and expansion of business and the new corporate structures which it has been found necessary to create have, for the present at least, outrun the ability and capacity of the general public to understand them. He referred to consolidation of railroads, growth of chain stores, branch banking, holding companies and investment trusts, which are arousing intense interest and provoking discussion on the part of the public. He referred also to the keen and growing competition between gas and electricity and with other fuels in cooking, in refrigeration and in any field where heat is required, and to the fact that in spite of this competition the demands for both services are materially increasing and in consequence rates are being reduced. These reductions in Pennsylvania, he said, according to figures of the Pennsylvania Public Service Commission, have resulted in savings to customers of more than $20,000,000 during 1927, 1928 and 1929. In the group of Pennsylvania companies, included in the U. G. I. System, voluntary rate reductions during the past five years have saved customers more than $8,500,000.

Referring to public relations, he said: "The problems of public utilities in the future will be largely in the field of public relations. Gas and electric service throughout the country has been brought to a very high standard. Twenty-four hour service in the utility field is universal. The millions expended in gas and electric plants and distribution systems, in tie-ins and interconnections, guarantee a practically uninterrupted service. As a result, criticisms of service, common twenty-five years ago, now are rarely heard.

"Practically every problem of public relations can be traced in the last analysis to the inability to agree upon some sound, economic and acceptable basis for rate-making.

"Disputes over the proper valuation of railroad and public utility properties have for over thirty years given rise to costly and protracted litigation in both state and Federal courts, and have been responsible for most of the antagonism to and criticism of our operations and policies. The criticism of our rates, wherever it is found, is based largely on the feeling that such rates have been constructed to yield a return on excessive and inflated values of the properties which are devoted to the public service. The movement for government and municipal ownership derives its support, in part at least, from the conviction on the part of its advocates that on a valuation such as would be established under government or municipal ownership and operation, rates could be materially reduced.

"There have always existed two distinct schools of thought on this subject, one holding to the theory of original cost, the other to that of reproduction value as of the time of the inquiry. Today the controversy is between the supporters of the prudent investment theory (the old original cost group) and the reproduction new theory as the basis of valuation. The significant fact is that these two groups

have not consistently maintained the same theory. In the latter part of the nineteenth century when the cost of labor and material had been steadily declining after the Civil War, the representatives of the public contended that the only fair rate base was that determined by the reproduction theory based on then existing costs of labor and material, irrespective of what the property originally cost. The owners of the public utilities, on the other hand, insisted upon original cost as the proper basis of valuation.

"With the great increase in costs within the last twenty-five years and especially since the World War, we find the position of the respective parties exactly reversed. It is the representatives of the public who are now loudly demanding that original cost is the only proper method of valuation, while the public utility companies are insisting upon reproduction value at present prices.

"It needs no gift of prophecy to predict that if prices of labor and material continue to decline for the next ten or fifteen years, the public utilities, faced with the fact that their properties have been largely rebuilt since the war at the peak of prices, will be found insisting that these investments must be protected and that the measure of value is original cost, while the representatives of the public, with equal disregard for consistency, will be stoutly contending for the reproduction theory at the lower price level.

"In other words, at any given time each group will contend for that theory of valuation which it considers to be best suited to its economic needs. The principles laid down in the decisions of the United States Supreme Court may not change, but in the application of those principles the emphasis will be placed at one time on original cost, and at another on reproduction at current prices.

"All thoughtful students of this subject are agreed that this is not a satisfactory condition; that the value of the properties of these great public servants, the utilities, should not be subject to violent fluctuations of price levels; that temporary advantages gained under reproduction values are likely to be offset in a long period of declining values. The truth, as in most human controversies, probably will be found in the middle of the road, and it is the part of economic and industrial statesmanship to find it. If we bring to bear upon the subject the same intense study and application that we have given to other phases of our business, we will find the answer, which, to be final, must be acceptable to both the customers and the companies.

"The present time, when prices generally have become stabilized below war levels, would seem to be favorable to discuss this subject, especially as the value of public utility properties has not nearly so important a bearing upon the rate question as it formerly had.

"In the gas and electric industry generally, and certainly in Pennsylvania, rates are lower than the companies would be justified in charging in order to yield a proper return on a fair valuation of the properties. The guiding principle in rate-making is not 'all that the traffic will bear,' but how low can the rates be reduced to meet competition of other sources of heat and power and to induce the largest possible use of gas and electric service. Rates are now being made in accordance with the essentially American economic principle of mass production. Under this principle the greater the volume of business the lower the cost of production and distribution, which in turn justifies lower rates with a resulting increase in the volume of business.

"The gas and electric industry annually is expending in additions to plant and distribution systems over one billion dollars. That sum can only be justified by the prospect of increased business.

"Under a strictly scientific system of rate-making, rates are graduated according to the extent of the use of the service by the different classes of customers. Those customers who make the greatest demand upon the system for the longest period of time are entitled to the lowest rate. We must not overlook the fact, however, that the social factor enters into rate-making as it does into all of our other relations with the public, and therefore must be given due consideration in our rate structures. One of the surest ways to secure sympathetic support of the public is to see to it that in all future rate reductions, the domestic customer continues to share in the economies resulting from reductions in operating costs and increased efficiencies due to consolidations and mergers."

## Harry C. Abell Elected

AT the annual meeting of the Chamber of Commerce of the United States, held in Washington during the week of April 28, Harry C. Abell, a director and former president of the American Gas Association, and vice-president of the Electric Bond & Share Company, was elected by a big majority as a director representing the Natural Resources Production Department.

*H. C. Abell*

Among those present at the meeting representing the gas industry and actively participating in the election were B. J. Mullaney, P. H. Gadsden, O. H. Fogg, J. B. Klumpp, A. B. Macbeth, F. F. Schauer, A. J. Gounoud, T. J. Strickler, H. S. Schutt, F. R. Coates, A. F. Staniford, W. J. Clark, Alexander Forward, Birt Ridburg and K. R. Boyes.

The American Gas Association wishes at this time to extend its deep appreciation to the members, friends and allied associations throughout the country for their hearty response and effective support of Mr. Abell's candidacy.

### For Better Gas Service at Martinsburg

Employees of the Martinsburg Heat & Light Company have formed a "Better Gas Service Club," for the promotion of better gas service to the public.

Officers of the Club are as follows: H. C. Whiteford, president, Howard M. Hensler, vice-president, Mary C. Engel, secretary, and Fred E. Burch, treasurer.

# Domestic Gas Appliance Course Opens at Laboratory June 16

*An Attentive Class at Domestic Gas Appliance Course.*

DURING the week of June 16 the American Gas Association Testing Laboratory, at Cleveland, Ohio, again will conduct a course dealing with the operation and servicing of domestic gas appliances. The first course was given just a year ago, at which time thirty-five home service workers, service men and salesmen attended, coming from all parts of this country and Canada. The course was sponsored by the association's Home Service Committee, and was voted such a success by those attending that the committee decided to continue this educational activity in Cleveland this year.

The course is designed primarily to better acquaint those members of the industry directly interested in this work with various types of domestic appliances. It will serve also to broaden the view in regard to activities in the gas industry in general and home service work in particular.

A glance over the tentative program below will show that almost every type of domestic appliance now on the market will be discussed as to design, operation, adjustment and service. These points will be handled by four Laboratory testing and research engineers—N. J. Reiff, C. S. Stuckenholt, W. P. Cook and O. Lutherer.

General talks will be given by prominent men and women in the gas industry, whose names appear on the program. Speakers of especial interest to home service workers are members of the National Home Service Committee: Miss Elsie Hinkley, Miss Dorothy Shank, Miss Ada Bessie Swann, and Miss Ruth Soule, the latter being chairman of that committee.

The course will be open to anyone interested in this type of work. Invitations have been sent out to all company and manufacturer members of the American Gas Association.

Instruction work will be in charge of N. J. Reiff, of the Laboratory staff, with Miss Jessie McQueen, American Gas Association Home Service Counsellor at New York, assisting in the arrangements. Any inquiries regarding the course should be addressed to Mr. Reiff care of the American Gas Association Testing Laboratory, 1032 East 62nd Street, Cleveland, Ohio, or to the American Gas Association, 420 Lexington Avenue, New York City.

Following is the program of the Home Service course:

MONDAY, JUNE 16

9:00- 9:30—Registration.
9:30-10:00—Opening remarks by R. W. Gallagher, President of the East Ohio Gas Company.
10:00-10:30—Outline of Course.
10:30-12:00—The Effect on Appliance Operation of Chemical and Physical Variations in the Gas Supply—F. E. Vandaveer, Supervisor of the A. G. A. Testing Laboratory.
2:00- 3:00—Use of Portable Gas—Miss Elsie E. Hinkley, Home Service Bureau, Tappan Stove Company.
3:00- 4:30—Space Heaters—Laboratory Engineers.

TUESDAY, JUNE 17

9:00-10:00—The Home Service Workers Place in the Industry—R. M. Conner, Director of A. G. A. Laboratory.
10:00-12:00—Gas Ranges—Laboratory Engineers.
2:00- 3:30—Range Thermostats — Laboratory Engineers.
3:30- 4:00—Practical Work in the Adjustment of Range Burners and Thermostats—Laboratory Engineers.

WEDNESDAY, JUNE 18

9:00-10:00—A Broader Program for Home Service—Miss Jessie McQueen, A. G. A. Home Service Counsellor.
10:00-12:00—Lecture and Demonstration on Time and Temperatures for Cooking—Miss Dorothy Shank, Director Research Kitchen, American Stove Company.
2:00- 4:30—Water Heaters—Laboratory Engineers.

THURSDAY, JUNE 19

9:00-10:00—Incinerators—Laboratory Engineers.
10:00-11:00—Home Service as a Sales Activity—Geo. E. Whitwell, V. P. Equitable Gas Co., Pittsburgh, Pa.
11:00- 3:00—Luncheon Talk—Miss Florence LaGanke, Director of Women's Activities, Home in the Sky, Builder's Exchange, Cleveland.
3:00- 4:30—Selection of Central Heating Appliances and Operation of Controls—G. B. Shawn, Chief Engineer, B-Line Boiler Co.

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# The Gas Industry as a Field for Investment*

By B. J. Mullaney

President, American Gas Association

*B. J. Mullaney*

IN approaching a discussion of "The Gas Industry as a Field for Investment," it is well to make sure that we understand one another in the use of certain terms. By the two words, "gas industry," we designate collectively the business enterprises engaged in the production and distribution of gas—both manufactured gas and natural gas—which enterprises culminate in the gas service familiar to all of you as an everyday detail in your homes and your places of business.

This gas industry is a distinguished member of the Public Utility family, other conspicuous members of which are the electric light and power, the telephone and the local and interurban transportation industries. From the investment viewpoint, therefore, the gas industry shares in those considerations which have established sound public utility securities as preferred investments, second only to federal, state and local government bonds in strength and reliability, and yielding generally a considerably better return.

But the gas industry, as the oldest member of the Public Utility family, has characteristics peculiar to itself, which are of additional investment significance.

Gas, the product or commodity of this industry, was discovered and named in the 16th century by a Belgian alchemist. As a practical thing, the industry dates from the early years of the 19th century. The first company ever set up to make and distribute gas commercially was chartered in London in 1812. In America, the industry dates from 1816, and the city of Baltimore.

Until near the dawn of this 20th century, the gas industry was predominantly and most of the time exclusively a lighting industry. Since then it has executed a complete "about face" and is now predominantly and almost exclusively a heating industry, a fuel industry.

I am speaking now of manufactured gas only. Natural gas will receive due attention later on.

When electric lighting began to push gas lighting aside, many industrial forecasters became pessimistic about the gas business. Some of them continued to read the Prayers for the Dying over it until eight or ten years ago. Doubtless they were only responding to erroneous pre-conceptions of both gas and electricity as essentially lighting agencies, and therefore inevitably and directly competitive. Meanwhile, the facts were making their predictions look silly.

Electricity and gas are not really competitors. They are simply different forms of energy, each with a distinctive field of usefulness: gas for heat; electricity for light and power.

The gas industry was regenerated, instead of damaged, by Edison's electric light and consequent electrical development. It was driven to find new outlets for its product, and in so doing it found and developed its natural field as a heating or fuel industry, with certain notably significant results.

Loss of the lighting business to electricity did not stop, and did not materially check the growth and expansion of the gas industry. Year by year, as it dropped the lighting business and took on heating business, the industry continued to increase both its output and its gross revenue, although it had to make up for the lighting losses each year before it could register a net gain. What industry can offer more convincing evidence of inherent vitality, resourcefulness and stability?

Now mark one of the cumulative consequences of this growth. In the last dozen years the manufactured gas industry has produced and distributed more gas than had been produced in all of the previous one hundred and odd years since the first gas company began business in London in 1812. There you have further evidence of inherent vitality and strength.

The factors that have produced these results—and this is directly pertinent to the investment consideration—the factors that have produced these results are still at work. Chief among them, speaking broadly, is the recognition and development of gas as the ideal fuel—clean, convenient, efficient, flexible, controllable to the fraction of a single degree of temperature: the ideal fuel for some thousands of industrial purposes, from tempering watch springs to the heat-treating processes of heavy manufacturing; ideal for every domestic fuel purpose, from boiling an egg to heating the whole house, with refrigeration as a side line.

This development goes steadily on. Just a few years ago—scarcely more than ten—general house heating with gas was thought to be of doubtful practicability. Today house heating is an accepted function of a gas company, and employment of the same plant for cooling the home in summer is discussed as a practicable possibility.

Industrial institutions that counted

*Radio address delivered on the Halsey, Stuart & Co. program over the National Broadcasting Network, April 23, 1930.

their use of gas in thousands, or at most hundreds of thousands of cu.ft. per month a few years ago, are now using it in millions of cu.ft per month. And this industrial use is stimulated ever more and more by the economic and conservation trends toward elimination of smoke, elimination of traffic-congesting transportation of crude fuels, and elimination of the waste of valuable by-products involved in the burning of crude fuels in the raw state.

Thus far I have been speaking more particularly of manufactured gas. Now comes natural gas to enhance and emphasize the significance of all that has been said.

Natural gas is nothing new. Recorded employment of it dates back to 1840. Since then it has been often of high commercial, industrial and financial importance, especially in and near the petroleum-producing fields. But there were difficulties of transmission and other circumstances which generally confined the use of it to localities relatively close to the point of production.

All that has been changed by developments collateral to, and in connection with, the discovery of immense new natural gas fields within recent years, especially in California, in some of the northern Rocky Mountain states and in Oklahoma, Texas and contiguous areas.

Natural gas pipe lines up to 500 miles in length are in operation, and lines a thousand miles long are in contemplation. The trend is toward tying in these natural gas transmission systems with the gas distribution systems already existent in the centers of industry and population. Hence the vision now coming to many practical men—a vision of the country's enormous natural gas resources coordinated to augment and multiply the usefulness of the gas industry as a public utility, and correspondingly enhancing its importance as a field for investment.

Approximately 75 per cent of all of the gas distributed in the United States last year was natural gas. It amounted to upwards of one trillion eight hundred billion cubic feet, a figure of astronomical proportions that does not mean much to most of us. This production is backed by estimated reserve supplies of a magnitude simply beyond human comprehension when stated in terms of arithmetic.

But dealing with this enormous accession to the gas-fuel resources of the country appears to be well in hand. Except in the matter of production, the problems of a natural gas business and of a manufactured gas business are practically identical. They are largely problems of engineering, of marketing and of personal service to customers—problems of *management,* in which the manufactured gas side of the industry has had ample experience. And this experience is all at the service of natural gas by reason of the co-ordinating influence of the American Gas Association, to which reference has been made.

From the investment viewpoint there is only one cautionary suggestion to be offered. Natural gas development is coming on at a rate so spectacularly rapid that, like all new and spectacular businesses, it may be expected to attract promoters of natural gas projects whose company-promoting zeal is not adequately counterbalanced by experience in gas company management and by due regard for the responsibilities of management. This is always a consideration to be taken into account in choosing an investment security. It has been well said that a gas well, a pipe line and some prospective customers do not necessarily make a successful gas business. It takes *management* to make the business go. The character and experience of that management are of prime importance to the prospective investor.

Therefore, in view of all the circumstances mentioned or implied in this necessarily brief outline, it must be apparent that the gas industry is unsurpassed as a field for investment—not for speculation, but for investment. It offers no lure of extraordinary profits. On the other hand, the risk of loss is reduced to a minimum, by reason of the long and seasoned character of the industry, when the investment is prudently chosen.

In making this choice, there are four main questions to be asked: (1) Does the gas company, whose security you are considering, operate in a productive territory, with reasonable prospects for growth and expansion? (2) Are the company's property and its sources of supply adequate in extent and physical condition for the demands upon them? (3) Is the management of the company alert, enterprising, competent and honest? (4) Are the industrial and public relations of the company satisfactorily wholesome—does it get along harmoniously with its employees, with its customers, and with the general public, including the regulatory authorities? For if these relations are good, the company is not likely to be politically harrassed.

When these four questions, and the others naturally collateral or subordinate to them, can be answered in the affirmative, the securities of the gas industry, in common with all sound public utility securities, are rightfully held to be preferred investments. For, as stated in the beginning, they are second only to federal, state and local government bonds in strength and reliability, and they yield a considerably better return.

## Mr. Apmann Leaves Consolidated Gas Co.

ARTHUR M. APMANN, assistant to the director of sales and utilization, The Consolidated Gas Company of New York, has resigned his position to become affiliated with the Bryant Heater and Manufacturing Company, of Cleveland, Ohio.

Mr. Apmann sailed for Europe on May 14, on the *Europa,* for a trip of seven weeks' duration. While abroad he will visit England, Germany, Switzerland, and France.

He will be in Stuttgart from May 26 to 28, as the official representative of the American Gas Association at the annual convention of the German Gas Association, and in Paris from June 10 to 14 as the A. G. A. delegate at the convention of the French Gas Association.

Mr. Apmann also will attend the Second World Power Conference at Berlin, from June 15 to 25, as one of the official delegates of the College of Engineering of New York University and the American Gas Association.

On May 9, a group of Mr. Apmann's friends and associates with the Consolidated Gas Company tendered him a testimonial dinner, and presented him with a motion picture camera.

## Natural Gas Generates Electric Power

ACCORDING to the United States Geological Survey, during the year 1929 the consumption of natural gas in generating electric power by public utility plants amounted to 112,706,617,000 cu.ft. The month of greatest consumption of natural gas in making electricity was October with 12,908,000,000 cu.ft. and the month with the smallest consumption was February, 7,187,498,000 cu.ft.

# Three Doctor's Degrees in Gas Engineering

SINCE its inauguration in 1924, the Department of Gas Engineering of the Johns Hopkins University, Baltimore, Md., has awarded three doctor's degrees in gas engineering, which is considered an unusual record. It is significant to note, by way of comparison, that in electrical engineering ten doctor's degrees have been awarded, in mechanical engineering one has been awarded, and, in civil engineering, none, since these departments were established in 1912.

Recipients of the doctor's degree in gas engineering at Johns Hopkins are as follows:

LLOYD LOGAN, whose Subject of Dissertation was: "An Investigation of the Manufacture of Water Gas with Especial Reference to the Decomposition of Steam."

C. GORDON MILBOURNE, whose Subject of Dissertation was: "The Removal of Hydrogen Sulphide from Gas by Means of Iron Oxide with Special Reference to Humidity Conditions."

JOHN C. HOLTZ, whose Subject of Dissertation was: "The Origin and Decomposition of Organic Sulphur Compounds Under Gas Making Conditions with Particular Reference to the Role of the Carbon-Sulphur Complex."

Instruction in the Department of Gas Engineering at Johns Hopkins began in October, 1924, the work being initiated with the appointment of a professor. Today there is a staff consisting of a professor, an associate professor, an instructor, a research associate, a research assistant, and two helpers in research. The student body consists of three graduate students, thirty undergraduate and nineteen extension course students.

## Students Set Up Unusual Record in Johns Hopkins Department

The University granted the first degree in gas engineering in America in June, 1926. The degree was a bachelor's degree, and was given to Donald T. Bonney. A total of twelve graduates have received bachelor's degrees since the course was established.

The university has sponsored lectures by prominent gas engineers, and is constantly publishing research and technical papers.

There are two fundamental purposes of the gas engineering work at Johns Hopkins—

1. To educate young men for technical service, who propose to make their careers in the gas industry.

2. To carry on scientific research for the benefit of the gas industry as a whole; and professional research on specific problems of immediate importance to some company or group of companies, under such arrangements as may be mutually agreed upon.

Twenty scholarships in the department have been founded as follows:

American Gas Association, 1; Mobile Gas Company, Mobile, Ala., 1; Philadelphia Suburban Counties Gas & Electric Co., Chester, Pa., 1; The Koppers Company, Pittsburgh, Pa., 1; The Tampa Gas Company, Tampa, Florida, 1; Columbia Engineering & Management Corporation, New York, N. Y., 1; The C. H. Geist Company, Philadelphia, Pa., 2; The Consolidated Gas Company of New York, New York, N. Y., 2; Consolidated Gas Electric Light and Power Company of Baltimore, Baltimore, Md., 2; Washington Gas Light Company, Washington, D. C., 3, and the Central Public Service Corporation, Chicago, Ill., 5.

Companies and individuals that have subscribed to support the gas engineering work at Hopkins for the second five-year period are as follows:

American Gas Journal, New York, N. Y.; American Meter Company, (Through the Maryland Meter Works), New York, N. Y.; Central Public Service Corporation, Chicago, Ill.; The Cleveland Heater Company, Cleveland, Ohio; Columbus Electric & Power Company, Columbus, Ga.; The Consolidated Gas Company of New York and Affiliated Gas Companies, New York, N. Y.; Consolidated Gas Electric Light & Power Company of Baltimore, Baltimore, Md.; Consolidation Coal Company, Inc., New York, N. Y.; Gas Purifying Material Company, Inc., Long Island City, N. Y.; The C. H. Geist Company, Philadelphia, Pa.; General Coal Company, (Joint subscription with Westmoreland Coal Company and Stonega Coke & Coal Company), Philadelphia, Pa.; General Gas Light Company, New York, N. Y.; Georgia Power Company, Atlanta, Ga., (also Athens & Macon, Ga.); Hartford City Gas Light Company, Hartford, Conn.; Jacksonville Gas Company, Jacksonville, Fla.; The Koppers Company, Pittsburgh, Pa.; Lambert Meter Company, Inc., Brooklyn, N. Y.; Middle West Utilities Company, Chicago, Ill.; Midland Utilities Investment Company, Chicago, Ill.; Northern Union Gas Company, New York, N. Y.; Peoples Gas

(Continued on page 282)

*Lloyd Logan* *John C. Holtz* *C. G. Milbourne*

# The Manufacturer's Viewpoint*

By E. S. DICKEY
Vice-Chairman Manufacturers Section,
American Gas Association

*E. S. Dickey*

IN talking on "The Manufacturer's Viewpoint," it will be readily appreciated this subject could be extended broadly, in fact, could be carried in an almost unlimited scope should the endeavor be made for a complete manufacturer's vision covering many angles and phases of the gas industry. I would, however, wish to first state I am not speaking from the viewpoint of "A" manufacturer, but shall endeavor, rather, to present a composite picture from the viewpoint of "The" manufacturer; in other words, I shall endeavor to speak impersonally and collectively.

Manufacturers in contact with the gas industry, particularly in the endeavor to secure the manufacturer's viewpoint, may properly be segregated into various groups, according to their degree of contact with the industry. First, the manufacturer with only part of his product for gas and with this portion of his product not sold to or through the gas company. Second, the manufacturer with all of his product for gas, but with his product not sold to or through the gas company. Likewise, we might say third and fourth, the manufacturer with part, or with all, of his product for gas where his product would be partially sold direct through ordinary commercial channels and partially to or through the gas company. Fifth, the manufacturer with only part of his product for gas, but with this product of such nature as to necessitate direct sale to or through the gas company and, sixth, and finally, the manufacturer with *all* of his product for gas, and with his product of such nature as to necessitate the entire product being sold direct to or through the gas company.

An attempt to set up a composite picture, even as a word picture, representing the varied viewpoints for any such diversification as indicated would be a rather difficult undertaking. Some manufacturers are more or less interested in trade reports, others not at all; equally, some are interested in credit bureau data, others apparently not. Nearly all are interested in group statistical data in one form or another, yet some apparently do not feel the necessity for, nor see any advantage in, such data and there are still other divergencies of opinion in more or less degree between the various groups.

It is to be reasonably expected the manufacturer would desire to aid in the advancement of the best interests of the gas industry with possibly an increasing ratio of effort in this direction progressively through the various groups already set forth. The manufacturer with only part of his product for gas may possibly be interested in the gas industry only in proportion as his product is diversified, but he nevertheless is interested. The manufacturer with part, or all, of his product for gas, partially or completely sold direct through ordinary commercial channels, is more definitely interested in the progress of the gas industry, whereas the manufacturer with all of his product for gas and with all of his product sold to or through the gas company, is even more keenly aware his success is dependent upon the success of the gas company and the success of the gas industry.

It is not the present intent to build up a complicated composite picture to in any sense deal with the various problems of the different group manufacturers, but rather to set up, if possible, a common denominator for *all* manufacturers and, in doing so, to as far as possible avoid minor detail for more important major considerations as to "The Manufacturer's Viewpoint."

It would appear there would be two major considerations well to the fore in any manufacturer's consideration of the gas industry; first, "The advancement of the best interests of the Gas Industry" and, second, "A closer cooperation between the Manufacturer and the Industry."

The determining factors in the advancement of the best interests of the gas industry, and in the success of the industry as a whole, undoubtedly cover a wide field, with an ever-increasing realization as to possible future activity and development, especially with the increasing ratio of natural gas production, long distance transmission and distribution in recent years and, more particularly, with the present broader vision for gas utilization in the field of domestic use for hot water, house heating and refrigeration; in commercial lines for hotel, restaurant and other similar work, and in the further development for the industrial use of gas.

Any attempt to visualize the manufacturer's contribution to the advancement of the best interests of the gas industry must be predicated upon the manufacturer, equally with the gas man, being sold on gas as a fuel. The manufacturer must be a booster for gas with an enthusiasm equal to that of

*Address delivered before the New Jersey Gas Association at Asbury Park, April 25, 1930.

the gas man himself but, of even more importance, the manufacturer, in his effort to advance the interests of the industry, must so conduct his business as to secure the confidence of the gas man and, through this confidence, endeavor to secure a more general acceptance by the industry as a whole for a closer cooperation between the manufacturer and the industry. The manufacturer realizes this cooperation is a necessity and feels this necessity must eventually be realized by the gas man in his viewpoint of and attitude toward the manufacturer.

The manufacturer, by the very nature of his contacts with the industry—in most instances having his knowledge not merely as to gas operations in one city or in one section of the country, but generally having the picture of the industry as a whole—cannot but appreciate the marked progress of the past few years and, in this knowledge, is unquestionably sold on gas as a fuel and on the industry as a whole. If any manufacturer does not have this enthusiasm; in fact, if any gas man or association member does not have this enthusiasm, it would be well for him to read the recent address before the Joint Convention of the Illinois Gas Association by Mr. Bernard J. Mullaney, President of the American Gas Association—Mr. Mullaney speaking on the topic "What is Ahead of Us?" This paper is illuminating. First, Mr. Mullaney points out the title of this address is a trick of phraseology and that, in asking the question in its simplest form, the obvious answer would be: "Nothing and nobody is ahead of us." This is indeed a wonderful statement for any industry and certainly should make every man in, or connected with, the gas industry feel not merely a renewed interest in the industry or in his particular job, but should furnish food for thought for all associated with the gas business in their attitude toward the conduct of the business and should furnish a resultant added confidence in the presentation of the industry to the public.

Mr. Mullaney evidently felt his statement should be pressed home, and did so by the very striking point brought out, which is well worth repetition: "Gas and electricity, as we know, are simply different forms or sources of energy. The energy distributed as natural and manufactured gas in the United States in 1929 was the energy equivalent to 835,000,000,000 kilowatt hours of electricity, and that amount of electricity is more than nine times the total United States production of electricity in 1929. So the electrical business is still the 'little brother' of these Energy Twins."

Both the manufacturer and the gas operator may well give more than passing consideration to a further paragraph in Mr. Mullaney's address, his remarks evidently applying with direct reference to the gas industry—"One of the drags on efficiency and progress within a company organization, according to my observation, is the tendency of experienced people, including department hands, to think they know all there is to know about their respective jobs, each one's horizon bounded by his own little watertight compartment—no adequate correlation of himself and his job to the other departments and functions and the broader interests of his company as a whole. Companies can handicap themselves by analogous isolation from their neighbors in the industry." This comment by Mr. Mullaney clearly refers to internal departmental relations and the relations of one organization with another, as well as the broader general relation through association activities and, from this same angle, it might be well to have one further thought from President Mullaney.

Referring to the value of association work, he touches upon the different phases of various association activities and makes a final significant statement on this subject—"If an association is not doing all it can or should do for us and our companies, the smart thing is to jump in and help correct the defects. We don't improve our golf scores by locker-room criticism of the association rules."

In discussing the manufacturer's viewpoint for the manufacturer's advancement of the best interests of the industry, and his efforts for a closer relation between the manufacturer and the industry, it is the manufacturer's desire to follow President Mullaney's advice to "jump in and help," certainly not to stand on the side lines and aimlessly criticise but, in his attempt for active cooperation with the industry, the manufacturer has heretofore not always found a receptive attitude for cooperative effort, particularly where he has endeavored to make contact with a gas company organization having an attitude of isolation such as cited by Mr. Mullaney. There should certainly be a mutual desire for complete coordination of effort between the gas company organization and the manufacturer, as it is very difficult indeed for any manufacturer to step over a self-established limited horizon or to break into a self-established, ironbound, watertight compartment.

As to the necessity for this closer cooperation between the manufacturer and the industry, it might be well to consider that after the manufacture or production of gas, the transmission and distribution of gas, in the final analysis the gas company does not market, sell or otherwise dispose of its product merely by a stop cock on the house riser or service pipe, but rather in the completion of the sale to the gas consumer there is customarily provided either an appliance for domestic use, or an especially designed apparatus for commercial or industrial use, and on the design and efficiency of this appliance or this apparatus will very largely depend the remaining vital factors as to the stimulation on future gas sales, as well as the creation of the satisfied consumer. It is from this viewpoint the manufacturer feels that in the advancement of the industry many vital problems of the present, and even more vital problems of the future, in the broadening utilization of gas, must be worked out through close cooperation between the manufacturer, or producer of the appliance or apparatus and what, in fact, is the intermediate agency, the gas company in charge of the placement and operating supervision of the appliance or apparatus in giving service to the ultimate consumer.

There may be further thought along this same line in referring to a paper on "The Economics of Load Building," presented by Mr. Samuel Insull, Jr., at the American Gas Association Convention in October, 1929. Mr. Insull very properly states the economics of sales promotion is a subject

too comprehensive to be dealt with reasonably in a single address; that the gas industry, moreover, is well aroused to the crying need for additional sales and later states the intensive expansion of the market is almost entirely the result of cultivation, so that increase in sales in this field can be only the result of sales promotion, citing three possible means of expanding the sale of any product—first, the price can be lowered; secondly, demand can be stimulated in the mind of a possible purchaser through advertising and, thirdly, the pressure on the supply can be increased by adding to sales impetus.

Of Mr. Insull's three possible means for expanding sales, reference may be made to two—prices can be lowered and demand stimulated through advertising. Predicating prices can be lowered, is this entirely a matter of rate adjustment for lower prices on gas, or would this also include the stimulation of sales by lower prices for appliances and apparatus? If so, can the manufacturer cooperate, not by lowering quality to cut prices, but rather through an intelligent analysis with the industry as to requirements, improvements, possible simplification or redesign? Again, in stimulating demand through advertising, may this not also involve the manufacturer's cooperation in possible redesign, not only for simplification, but equally for attractive appearance, durability, safety and increased efficiency or better utilization? Relative to this matter of advertising, many manufacturers have extensive advertising on their own account where closer cooperation with the industry might possibly bring about a better coordination of advertising effort.

In a further paper by Mr. Insull, "Putting All the Gas Dollars to Work," being an address before the Mid-West Regional Gas Sales Conference, Chicago, February, 1930, there is reference to and recognition of the appliance. Mr. Insull, in this address, deals at some length with the appliance in particular reference to domestic installation, asking "What have we got to do?" and answering "We not only have to install these appliances in the houses, but in so doing make the house sufficiently more attrative to compete with the multifarious outside attractions that have grown up around modern life," further stating "It is no use to go out and try to sell people on just practicability plus convenience. That is old stuff. What you have to sell them on is attractiveness," thereafter commenting "I think, to give them due credit, the equipment manufacturers have a great deal coming to them because they have demonstrated an effort to make a lot of these domestic appliances look better. I am not interested so much in whether these things look better. I think some of them are terrible; I wouldn't have them around my place. But the important thing is that somebody is trying to make them look better."

The manufacturer recognizes the point brought out by Mr. Insull for assistance in gas sales through the medium of attractive appliances, but he also recognizes, in the present technical development of the industry, his efforts should not and cannot be directed solely toward an improvement in appearance to present an attractive appliance or an attractive piece of apparatus, but hand-in-hand with this must go an improvement in construction and design for durability and, of even more importance, a definite improvement in utilization safety and efficiency.

At the annual convention of the New England Gas Association in February of this year, Col. Oscar H. Fogg also presented a paper under the title "Economics of Load Building," Col. Fogg stating there would be very little he could present under this title that had not already been considered or discussed, referring especially to the address of Mr. Insull as being of particular interest, further stating "My interpretation of the 'Economics of Load Building' is simply the profitable expansion of our business along sound, economic lines," and thereafter making the significant comment "One of the gas industry's most pressing needs at the present time is a more rational alignment of the various components of our sales activities in accordance with sound economical principles. . . No one person can hope to accomplish all this unaided and alone, but it can be accomplished definitely and without too much delay if we undertake it as an industry, working together." Col. Fogg here expresses the manufacturer's viewpoint—"No one person can hope to accomplish all this unaided and alone"—and the manufacturer, realizing the importance of his product and the necessary further development of his product, wishes to add to his constructive effort toward the further advancement of the industry as a whole.

In concluding his address, Col. Fogg refers to the "Evolution of the A. G. A. Field Survey," being the field survey of domestic, commercial and sales management practice authorized during March, 1929, by the Executive Board at the request of the Commercial Section. Col. Fogg indicates the survey has been very complete, having been broadly set up with the major purpose of finding out the best methods in the gas industry for various objectives, and thereafter indicating six general lines of inquiry which had been followed in making the survey.

This entire address with reference to the A. G. A. Field Survey is very comprehensive, and should be read by any one in the industry interested in sales promotion work; in fact, it should be read by the entire industry. It is sufficient here, however, to refer to the sixth line of inquiry, stated by Col. Fogg as follows:

"6. Appliance Manufacturers. A number of appliance manufacturers were visited to get the benefit of their views on the sales practice of gas companies. Their comments proved helpful in forming a complete picture of the gas sales situation."

This recognition of the appliance manufacturer, and the effort to secure the benefit of his view on sales practice, is most encouraging as, if the manufacturer's viewpoint has, as indicated by Col. Fogg, proved helpful in forming the complete picture as to the sales practice of gas companies, then undoubtedly, in the further development of the industry, the manufacturer's viewpoint should also prove of even greater value for cooperation with the industry in respect to advertising, research, design or other detail affecting the appliance or apparatus which, as stated, is, in the final analysis, an important factor in gas company promotional sales furnishing.

from a utilization viewpoint, the final contact with the consumer.

In view of the situations just set forth, the manufacturer feels his responsibility toward the advancement of the best interests of the gas industry; he desires a closer cooperation between the manufacturer and the industry and, with these objectives, the average manufacturer is placing an extensive study back of his product including, in many lines, a very considerable amount of research and laboratory investigation and development. By the very commercial nature of his business he is forced to produce the most efficient and durable product to sell at the closest possible figure consistent with cost of production, but even beyond this necessary position the average manufacturer desires to add his bit toward the advancement of the industry by closer co-ordination on advertising and research, and by even greater perfection of appliances, apparatus, machinery, etc. He feels this can only be accomplished through a closer mutuality of understanding and a closer contact with the industry.

Generally speaking, the manufacturer does not feel there can be any message more important than the desire to establish a spirit of frankness, a spirit of understanding, between himself and the executives and operating men in the gas industry proper, in order to break down any and all barriers that may prevent free and open discussion of all problems relating to their mutual interests in the further development of the industry. The manufacturers are endeavoring to develop their business along practical lines for the greatest possible assistance in the technical development of the industry and, as stated, feel cooperation from the gas company executives and operators, as well as cooperation in association work, is a large factor in the general effort to give the gas business of the future more definite technical and scientific direction.

Through activity in association work, the manufacturer feels he is enlarging the opportunities of all individuals and groups with whom he has relations; he is endeavoring to eliminate chaos and guess work with the purpose, if possible, of generally speeding up important work all down the line for an improvement in design, in durability, in safety and in efficiency on the products manufactured and for a better understanding with the industry for the development of products in anticipation of futurity demands. The manufacturer feels an improved morale and mutual confidence will undoubtedly result from a general understanding of basic conditions, which can be brought about only through intimate association and closer contact between the manufacturer and the gas industry; that is to say, between the manufacturer of the products and the buyer of same.

It might not be amiss at this point to say the manufacturer has at times been impressed by the fact his advances toward cooperation with the industry, particularly in respect to some of the association meetings, may be misinterpreted by the gas man. The manufacturer does not send his salesman or representative to an association meeting, making use of expense funds, purely for the purpose of entertaining prospective buyers in order to gain their good will for immediate orders. True, the manufacturer must make a market for his product, must obtain orders, must make sales, but he also recognizes the necessity of sociability and better acquaintanceship for the establishment of confidence through closer contact with the customer. Accordingly, his representation at conventions and the calls which his representative or which the manufacturer himself makes on the industry have a broader objective than the question of immediate sales, in that the manufacturer is endeavoring by these means to establish a closer cooperation between himself and the industry for the purpose, through an interchange of comment, of gaining knowledge that will assist in perfecting his manufacturing process and product and thereby aid in the further general sales promotion of the industry.

The manufacturer's viewpoint may be summed up in a belief that the manufacturer must continue his efforts for the advancement of the best interests of the gas industry, and to do so must continue to strive for a closer cooperation, a closer relationship, a better mutuality of understanding, both among the manufacturers themselves and in their relation and contact with the utility operators, with the knowledge that improvements and developments must necessarily largely be inspired by or be satisfactory to the customer—and all with the objective that such cooperation may serve as a stimulant and an impetus in the manufacture of products for the further development of the business of the manufacturer, the business of the gas company and, in the broadest sense, of the gas industry as a whole.

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## Southwestern Gas Measurement Short Course

A NEW record of attendance, approximately 450, was established at the seventh annual Southwestern Gas Measurement Short Course held at the University of Oklahoma, Norman, Okla., April 15, 16 and 17. The registration included representatives from twenty states and two foreign countries, making this project, which was local to the State of Oklahoma in its beginning seven years ago, now truly international in its scope and interest.

An important recognition of the project this year was the presence of a group of engineers belonging to the Fluids Meter Committee of the American Society of Mechanical Engineers. This group was headed by R. J. Pigott of Pittsburgh, Pa., of the research department of the Gulf companies. As a result of the attendance of the A. S. M. E. group a close working relationship between the natural gas industry through this measurement course and the general subject of fluids metering has been established.

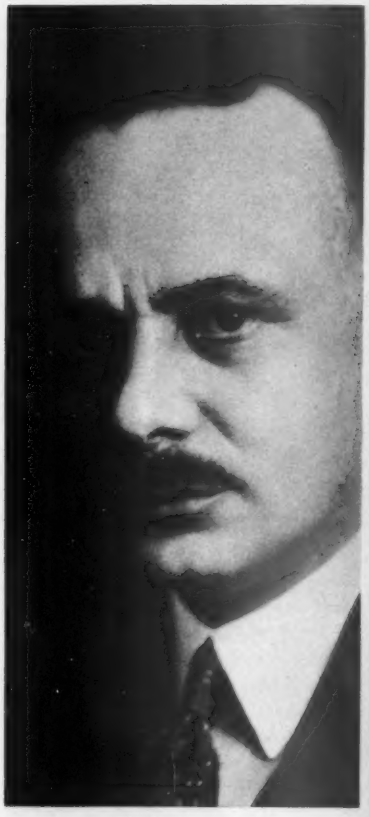
The course was first suggested to E. F. McKay, manager of the Oklahoma Utilities Association in 1923, by W. H. Crutcher of Muskogee, Okla. The suggestion was taken up with the president and engineering faculty of the University of Oklahoma and with the Corporation Commission of Oklahoma with the result that these three interests joined in sponsoring a gas measurement short course, which has now enlisted the active interest of the entire natural gas industry of the Southwest, and has become the largest and most successful project of its kind in the country.

The purpose of the course is to provide, through cooperation of the various interests mentioned, an opportunity for men in the natural gas industry to get together and study problems pertaining to the measurement and regulation of dry and casing-head gas, hoping thereby to more nearly establish full accuracy of measurement and efficiency of regulation of natural gas, to the end that the public may be better served, dealings between buyer and seller put on a more accurate and equitable basis and that correct information regarding the engineering and practical problems involved may be disseminated among the men identified with the natural gas industry.

# One Million Opportunities!

By J. David Houser

J. David Houser and Associates



*J. David Houser*

"ME gettin' called up on the carpet!" snorted *Coca Cola* indignantly—"*me,* and tryin' the way I always do to be c'urt'us; I'se 'regusted' fo' fair."

*Coca Cola* bore this nickname because his proper surname was Greek and unpronounceable to his fellow conductors. Slow and not overly-intelligent, he was nevertheless unsurpassed on the system for sincerity and earnestness. Having heard the various edicts from official sources covering the necessity for constant courtesy in dealing with passengers, *Coca Cola* had faithfully responded and, insofar as his lights permitted, had become a constantly trying Chesterfield.

And so his amazement was profound and his chagrin deep when his presence was required before the superintendent of transportation to answer a passenger's complaint against him on the score of discourtesy.

"I know the rules," bitterly remarked *Coca Cola.* "I know what they've been sayin' about c'urt'sy—I've been doin' everything but kissin' their hands."

"What really happened, *Coca Cola?*" asked one of the amused group about him.

"The old lady got on at Twenty-fourth and Jones Street," he narrated, "and she gave me a transfer and it was bum—very bum."

"Madam—I said 'Madam' and I even bowed—I'm very sorry, but this transfer ain't no good."

"No good," says she—"no good?" "*Why* ain't it no good?"

" 'Because, madam,' says I, 'it can't be used in this direction—it's only good goin' the other way'."

" 'Well' says she, 'I've used one like it on this corner every day for the past month!' "

" 'I'm very sorry, madam,' says I, 'but you're caught at last!' "

"And they called me on the carpet," remarked *Coca Cola* both ruefully and vindictively "and gave me h-l- me of all the guys on the line—me whose middle name is c'urt'sy! An' I ain't got it clear yet why they picked on me."

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No one even slightly acquainted with the attitude of public utility management today could fail to be aware of the widespread conviction of the importance of good public relations. No one could question the sincerity of the vast majority of public utility executives in wanting to do every reasonable and practical thing to make the public relations of their companies as good as possible.

It is therefore little short of astonishing that the greatest of all opportunities for cultivating public good will lies practically uncultivated—an opportunity that even in a small company is multiplied a million times per year and in a large one not less than several million times.

This is the opportunity of stimulating the best possible quality of public and customer contacts on the part of the large percentage of employees in every public utility company who make such contacts.

Every company is to a large extent made up of men and women contact employees with characteristics like *Coca Cola's*—in varying degrees, of course. And in almost none of them has any better stimulation been brought to bear upon them than *Coca Cola* experienced.

"Courtesy" is preached with varying emphasis, but the effort stops here. The trouble is that "courtesy" is a subjective abstraction, and it means a different thing for each person who preaches it and for each who hears.

Perhaps, however, this matter of "personal service" or of customer-employee contacts has been overemphasized? Perhaps it is not so powerful an element after all. Possibly other things—rates or what not—are of far greater influence?

In a recent study of public attitude toward a group of utility companies in a large city, some striking results were obtained when three curves were plotted on one base line. These curves covered (1) public attitude toward private ownership as contrasted with public ownership, (2) public attitude toward "service"—all the elements of company performance which affected the public, and (3) the actual quality of contact employees' treatment of customers. It is perhaps sufficient to say here that the different attitudes were measured by means of carefully worked out personal interviews, while the quality of employee treatment of customers was measured by having people approach the different contact employees, act exactly as customers, go through the different contacts and then rate numerically the effect produced upon them by these contacts (names of employees not being sought or reported).

The curves showed the following deeply significant results:

(1) General attitude toward public ownership (as contrasted with private ownership) very similar to attitude toward "service." This and other data brought the conviction that there was a strong cause-and-effect relationship here—that a very important element in creating an attitude for or against private ownership and operation was the attitude created by "service."

(2) Public attitude toward "service" and actual quality of employee treatment of customers was very similar. Again supporting data tended to confirm the conviction that these two elements were pretty closely connected—that attitude toward "service" as a whole was very largely determined by the quality of personal treatment received from contact employees.

(3) The conclusion was therefore inescapable that the quality of employee contacts was, in the last analysis, one of the principal causes of the final attitude toward "service" and therefore toward private ownership as opposed to governmental ownership!

(4) All three of these curves bulked decidedly around the midpoint of the base line—that is, the largest part of the attitudes represented were indifferent—representing lack of any strong hostility or enthusiasm. Likewise, the quality of the personal service being rendered was indifferent and mediocre. Little was definitely bad; little was decidedly good.

It is around exactly this point—the comparative indifference and ineffectiveness of the great part of the personal service being rendered customers in the public utility of today—that by far the largest part of the problem of public relations lies.

This type of public and customer contact represents first of all an outstanding weakness, for its effect is to create a similar attitude of indifference toward the company on the part of its public. It is not hard to realize that such a general attitude means a fertile field for possible suspicion—no matter how unjustified—and a public ear easily reachable by hostile agencies.

In the second place it represents a very great—and intriguing—challenge to utility management. The opportunity presented and the certain results which would flow from the creation of distinguished personal service should both be evident.

How can this be achieved? The answer can only be found in ceasing to rely upon the hope that vague preachments upon such abstractions as "courtesy"—no matter how often repeated by executives—will bear any practical fruit. No amount of "telling," talking or lecturing of such a nature will accomplish anything.

Effective contacts are an art. They involve definite principles, definite subject matter and definite methods. They require first of all that employees be stimulated to realize the almost professional possibilities in such work, and then that they learn—as much as possible through their own thinking—the concrete things to do and the concrete things not to do in dealing with other people who at the time are facing them.

The more contact employees can be led to realize that they are producing a definite product—customer or public attitude—the greater will be the likelihood of inspiring them with the desire of making that product constantly better and better.

The task is a specific one. It deserves a specific attack. And that is exactly the idea and plan of the American Gas Association course.

As a culmination of plans, two years in the making, formal arrangements have been completed for the launching of a Correspondence Course in Public Contact Training by the Committee on Education of Gas Company Employees of the American Gas Association.

This course will be written by J. David Houser and Associates. It will be based on the extensive experience of this organization in the analysis of public attitude toward utility companies and the training of employees in public and customer contact methods. Dr. H. R. Halsey and H. W. Schaughency of this organization will prepare and administer the course. These men have been carrying out the training programs of Houser and Associates and are thoroughly familiar with the problems involved.

The course, while worked out for individual use by correspondence, will emphasize the group conference method. It will develop the broad principles of public and customer contacting, but will also contain much concrete material on the details of this work in specific contact jobs.

Both general information regarding the course as a whole—its aims, ideals, methods and contents—and specific information regarding suggested ways of handling it by company members will be furnished through various media.

## Claims Championship As Meter Reader

JOHN J. FRY, employee of Houston (Texas) Gas and Fuel Company for forty years, claims a record of no mistakes in reading meters during that period. Mr. Fry started in the gas business 48 years ago in England with what was then the Corporation of Birmingham, England, as gas fitter and meter reader. He came to Texas after seven years' work in England and went to work with the Houston Gas Light Company. He has remained with that company's successor, the Houston Gas and Fuel Company, through four decades and is now the oldest living employee of the company.

## Alexander Forward Makes Richmond Civitan Award

ALEXANDER FORWARD, managing director of the American Gas Association, made the presentation address at a meeting of the Civitan Club of Richmond, Virginia, April 22, at a complimentary dinner to Tazewell M. Carrington, of that city, on the occasion of the award to the latter of an "achievement medal." Mr. Carrington, by unanimous vote of a citizens committee of one hundred was acclaimed as the citizen who had rendered "the most noteworthy service" to his city in 1929.

Mr. Forward was the first president of the Richmond Civitan Club, and was later president of the New York Civitan Club.

## Abandon M. I. T. Gas Course This Year

It has been announced that the gas course which has been held for the past several summers at the Massachusetts Institute of Technology will be discontinued. It is understood that it is practically impossible to secure a suitable date for the course this year but it will be continued next year.

# Equitable Gas Company Wins Rice Safety Award

FOR the second time within a comparatively short period, the Equitable Gas Company, of Pittsburgh, Pennsylvania, has earned recognition for the splendid work performed by its employees in the matter of safety. The first of these honors came in the fall of 1929 when the Equitable Gas Company won the National Safety Council's trophy for the best accident record among gas companies employing more than 1000 men for the first six months of 1929.

Further honors were bestowed upon the Equitable Gas Company recently by the Western Pennsylvania Division of the National Safety Council when it presented that company with the Rice Safety Award in recognition of its making the greatest improvement over its own previous three-year experience for the year 1929. The Rice Award is an annual award sponsored by the Western Pennsylvania Safety Council. It was originated in the year 1921 by Cecil G. Rice, then president of the Council, in memory of his father who worked as a railroader for a great number of years without a single lost time accident. It has been awarded yearly ever since, the following companies in the Western Pennsylvania District being recorded as winners:

H. H. Roberston Company, Ambridge; Beaver Valley Traction Company, Bell Telephone Company, Peoples Natural Gas Company, Mine Safety Appliances Company, and the Equitable Gas Company.

The contest basis is unique. All member industrial plants are eligible for the competition. Realizing that dissimilar enterprises cannot compete directly with one another because of the variance in the number and type of hazards, the contest is based upon the greatest percentage of improvement made over one's own three-year frequency and severity rating. The factor arrived at by multiplying the frequency and severity makes it possible to use both. Under the rules, the Equitable Gas Company made an improvement over its own three-year record of 99.75 per cent indicated as follows:

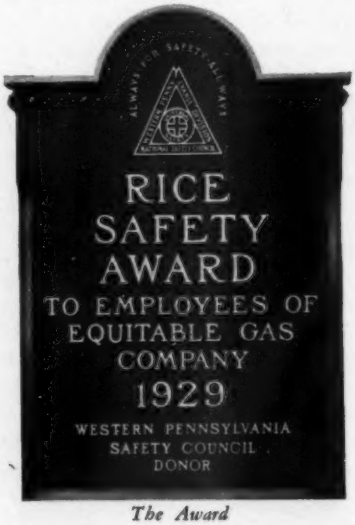
Total man hours, 2,603,237.

Total number of accidents, 11.

Average frequency for three years preceding year just past (1926, 1927 and 1928), 21.85.

Average severity for three years preceding year just past (1926, 1927 and 1928), 3.89.

Product, 84.9965.




*The Award*

Frequency for the year just past (1929), 4.22.

Severity for the year just past (1929), .05.

Product, .2110.

Percentage of improvement, 99.75.

National standards for computing frequency and severity are used with the customary rating for permanent and disabling injuries. On this basis many companies showed remarkable improvement, one large steel company almost equalling the record established by the Equitable Gas Company.

The presentation was made in a colorful setting which occurred on March 10 at 9:30 in the William Penn Hotel at the largest banquet ever held in Pittsburgh. The occasion was the completion of the annual safety lecture course for foremen. Employees of companies who successfully completed the course by attending four or more out of six lectures were present at the banquet.

The utility group, of which the Equitable Gas Company is a part, had the largest delegation, their employees numbering 571, 437 actually earning banquet tickets for faithful attendance upon the previous lectures. All told, more than 2,000 persons attended the affair. They were foremen and supervisors from all of the industrial plants of Western Pennsylvania—a splendid tribute to the cause of safety by the industries and the men in that territory.

In speaking of the success of the Equitable Gas Company, an official of the company indicated, it was due primarily to the interest and enthusiasm of every employee brought about by a thorough understanding by every man on the job, be he superintendent, foreman or laborer, that safety is a part of the job, the absence of accidents meaning that workers are capable and their occurrence indicating inefficiency.

## Report on Mixed Gas Available to Company Delegates

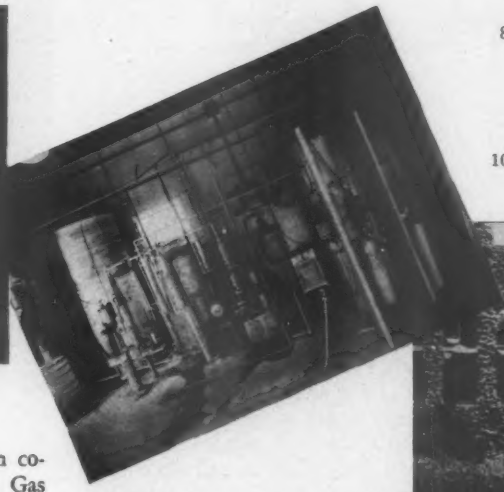
**A REPORT on the investigations made by the American Gas Association at its Cleveland Laboratory on mixing various kinds of gases is now available. The Executive Board has ruled that copies of this Report on Mixed Gas Research may be sent to delegates of member companies upon their request, all copies to be registered.**

**"These investigations were conducted in an effort to realize the production economies and other factors which may exist in the mixing of various kinds of gas with the hope that the practice might lead to a greater extension of our service to the public we serve," Alexander Forward, Managing Director, said. "The results as set forth in this report are worthy of the most careful study and consideration by the engineers of our company members."**

**Copies of the report will be sent delegates of company members on request to the American Gas Association, 420 Lexington Avenue, New York City.**

# Short Course In Gas Engineering at U. of I.

*Prof. D. B. Keyes*



*Interior of Laboratory at University of Illinois*

*Entrance to Chemistry Building at University of Illinois*

THE University of Illinois, in co-operation with The Illinois Gas Association, will hold its Fifth Annual Short Course, June 16 to 28.

The curriculum covers eight hours a day of practical, modern gas engineering presented in an understandable way by professors of national reputation and leading authorities in gas and allied industries.

With four years of successful experience ahead of it, this course covers subjects relating to the utilization of gas for Industrial, Hotel and Restaurant, House Heating and Refrigeration purposes as well as the general principles of combustion underlying all gas burning equipment.

Dr. D. B. Keyes, Professor of Industrial Chemistry and an authority on research, will conduct the course this year.

As new fields are being opened to the industry, with possibilities that could hardly be visualized a few years back, the importance of training men along technical lines of modern gas utilization cannot be too greatly stressed.

Applications for enrollment may be had by writing to George Schwaner, Secretary Illinois Gas Association, 405 Mine Workers Building, Springfield, Illinois.

The program follows:

MONDAY, JUNE 16

8:00-10:00—Registration and Introduction.
1:00- 3:00—Combustion of Elementary Fuels: Material Balances—Prof. D. B. Keyes, Department of Chemistry, University of Illinois.
3:00- 5:00—Properties and Combustion of Gaseous Fuels: Combustion Calculations—Prof. D. B. Keyes, Department of Chemistry, University of Illinois.

TUESDAY, JUNE 17

8:00-10:00—Properties and Combustion of Gaseous Fuels: Combustion Calculations (Cont'd)—Prof. D. B. Keyes, Department of Chemistry, University of Illinois.
10:00-12:00—Principles of Furnace Design and Construction—Prof. W. Trinks, Mechanical Engineering Department, Carnegie Institute.
1:00- 3:00—Principles of Furnace Design and Construction (Cont'd)—Prof. W. Trinks, Mechanical Engineering Department, Carnegie Institute.
3:00- 5:00—Problems of Forging and Rivet Heating—E. G. De Coriolis, Surface Combustion Company.

WEDNESDAY, JUNE 18

8:00-10:00—Properties and Combustion of Gaseous Fuels: Combustion Calculations (Cont'd)—Prof. D. B. Keyes, Department of Chemistry, University of Illinois.
10:00-12:00—General Principles of Metallurgy and Problems of Carburizing and Heat Treating—R. G. Guthrie, The Peoples Gas Light and Coke Company.
1:00- 3:00—General Principles of Metallurgy and Problems of Carburizing and Heat Treating (Cont'd)—R. G. Guthrie, The Peoples Gas Light and Coke Company.
3:00- 5:00—Problems of Annealing and Kindred Problems—W. O. Owen, Surface Combustion Company, Chicago, Illinois.

THURSDAY, JUNE 19

8:00-10:00—Furnace Efficiency and Distribution of Heat Losses: Calculations—Prof. D. B. Keyes, Department of Chemistry, University of Illinois.
10:00-12:00—Burning Common Brick and Refractory Brick—Prof. R. K. Hursh, Ceramics Department, University of Illinois.
1:00- 3:00—Burning Common Brick and Refractory Brick (Cont'd)—Prof. R. K. Hursh, Ceramics Department, University of Illinois.
3:00- 5:00—Vitreous Enameling—Dr. A. I. Andrews, University of Illinois.

(Continued on page 282)

# Henry L. Doherty Is Awarded Walton Clark Medal

FOR his outstanding and valuable work in developing the manufactured gas industry, Henry Latham Doherty, of New York, founder of Henry L. Doherty & Company and the Cities Service Company, was awarded the Walton Clark Medal by the Franklin Institute, Philadelphia, with appropriate exercises held in the Quaker City, May 21. Mason Hayward, president of the Franklin Institute, made the presentation, which was followed by a dinner in honor of Mr. Doherty and thirteen other recipients of medals that were awarded by the Institute. Mr. Doherty was the only one to receive the Walton Clark Medal.

The Walton Clark Medal was endowed in 1926 by The United Gas Improvement Company in honor of Dr. Walton Clark, for many years a vice-president and later consulting engineer of the U. G. I., to be awarded to one person each year by the Franklin Institute for original and notable work in the gas industry, or in case the Institute decided that no one in the gas industry was eligible for the award in any year, it might be made for original and notable work in any of the mechanic arts. Dr. Clark was awarded the first medal, in 1926, for distinguished service in the gas industry.

The Franklin Institute, established in 1824, is the oldest institution in the United States devoted to the study of applied science and mechanic arts. Its medals and certificates of award, given for the purpose of advancing physical science, are prizes of world-wide recognition. Each year the Institute awards the Clark Medal after investigation by a committee of experts appointed from a group of sixty men who constitute the committee of science and the arts. The organization publishes the *Journal* of the Franklin Institute, which is devoted principally to papers on science.

In a friendly talk that accompanied the unanimous decision to award the Clark Medal to Mr. Doherty, mention was made of the recipient's long years of service to the gas industry and his many inventions which have radically affected the development of both the electric and gas industries.

When only twenty-three years of age, thirty-seven years ago, Mr. Doherty began to propose improved methods for the manufactured and natural gas industries and since then many of the practices he suggested have been adopted as standard. Altogether, Mr. Doherty has more than 150 patents to his credit. He is the inventor of the Doherty Bench Fuel Economizer used in the manufactured gas industry, and of improved methods in the gasification of coal. He also invented a lime-burning kiln which was declared superior to all previous ones by engineers. His apparatus for washing and cooling gas is unique. His method, now standard practice, is that of showering water through the gas, then passing the water to a small cooler and back again as a spray in the gas.

In recent years Mr. Doherty has worked long and hard to bring about conservation of the country's oil resources. He was first to outline a definite plan to prevent the waste of petroleum. Several years ago he introduced "The Doherty Unit Plan" which provides for restricted drilling under government permit. His plan has since been endorsed at meetings of the National Petroleum Institute, which he was instrumental in founding during the World War, and the American Institute of Mining and Metallurgical Engineers.

The Walton Clark Medal has on one side a likeness of Dr. Walton Clark and inscribed around the edge are the words: "The Walton Clark Medal." The other side bears the legend "Awarded by the Franklin Institute to Henry Latham Doherty for original and notable work in the gas industry."

*Henry L. Doherty*

Mr. Doherty is an unique figure and a driving force in all of the industries in which his dynamic energy has been applied and which his constructive genius has helped to greater efficiency.

Student, inventor, philosopher, financier, a leader in three of the most important branches of American business life—gas, electric power and petroleum—he prefers to be known as an engineer.

Born in Columbus, Ohio, in 1870, Mr. Doherty left grade school at the age of ten, sold newspapers on the streets. Two years later became an office boy with the local gas company. Keen, independent, original, determined, hard-working and apparently imbued with an inexhaustible supply of mental and physical energy, he has made an indelible mark on the industrial history of the Nation. He is a self-educated man. His broad knowledge in the arts and sciences which has made possible the many convenient services enjoyed by the American public today was the result of self-teaching. Mr. Doherty says that his pre-

liminary education was secured from gas catalogs.

His never slackened thirst for facts still keeps him a student even when his business affairs have expanded to many times more than those of the average busy business man. To his associates he is known for seemingly uncanny foresight, for his remarkable resourcefulness under pressure and for his indefatigable ability to absorb hard work.

When he was working at top speed, regular hours for work, recreation and sleep meant absolutely nothing to this human dynamo of energy. His business conferences were as likely to be at 2. A.M. as at 2 P.M. and it was no uncommon thing for a visitor leaving his home on top of a skyscraper overlooking Battery Park and New York Bay at midnight to find others waiting to confer with this remarkable man. He never asked his associates or anyone else to do more than he was willing to do himself and there were few who could maintain the exhausting pace he set.

When a comparatively young man, about 22 or 23 years of age, Mr. Doherty began to tell the manufactured and natural gas industries that many of their methods were wrong. By the older leaders he was laughed at as an idealist and dreamer. Since then, many of the practices he suggested have been adopted as standard.

His experience in the electrical field was almost the same, but Mr. Doherty has been permitted to see many of his ideas adopted as standard practices in that industry as well.

Through the rapid growth of the business organization which this Scotch-Irish genius has established—the firm of Henry L. Doherty & Company formed in 1905 and Cities Service Company in 1910—he found himself entering another field. This was the production, refining, transporting and marketing of petroleum and its products. Here again the insatiable Doherty appetite for facts led to the development of new practices which are now generally followed.

During the World War, Mr. Doherty turned the operation of his many companies over to his associates and gave his services to the nation in Washington. It was due to his efforts that the National Petroleum Institute was formed, this being the first cooperative petroleum organization to be established.

In recent years Mr. Doherty has worked long and hard to bring about conservation of the country's oil resources. He was the first to outline a definite plan to prevent the waste of this valuable product, due largely to the excessive drilling done by the petroleum industry in the past dozen years. As far back as five years ago, he introduced "The Doherty Unit Plan," which provides for restricted drilling under government permit. During the winter of 1927-1928, his plan was endorsed in substance at official meetings of the National Petroleum Institute and the American Institute of Mining and Metallurgical Engineers.

The manufactured and natural gas industries owe to this remarkable man a large number of the standard methods now followed in the production and distribution of their products.

An outstanding contribution to the electrical industry was Mr. Doherty's development of the first New Business Department which was devised to increase the market for electrical energy through the sale of appliances and installations.

In the petroleum industry Mr. Doherty's inventions include a number employed in the refining and production of oil. Moreover, he was one of the first large producers in the Mid-Continent Field to employ trained geologists in surveying prospective and potential oil producing areas.

Mr. Doherty's ambition is to increase efficiency in all lines of endeavor to prevent waste and to stimulate thrift. His homely epigrams are well-known. Here are a few taken at random:

"The greatest human weakness is the tendency to abuse power."

"The greatest assets the world possesses are its great minds. We would be barbarians still if we depended alone upon the strength and endurance of human labor."

"Conflicts, big or little, should never happen; someone always gets licked. Ninety-nine times out of 100, yes, 999 times out of a 1000, both sides get licked."

"Radical subjects cannot be taken on a revolutionary basis, but can be taken on an evolutionary basis."

"A source of unclean information can poison many minds."

"Give me the man who lives to work and to do—not the one who works and does to live."

"To provide for the future is a part of one's responsibility in life and the world at large has scant courtesy for the man who neglects it."

It may seem strange that a man who has been so successful in all of the big things he has attempted should still have a boyhood hero. Mr. Doherty's hero was and still is Abraham Lincoln for whom he has the highest admiration. Few Americans have a more intimate knowledge of the life of the Great Emancipator.

Mr. Doherty's career is typically American, although more colorful than that of many who have attained success from a modest beginning. He was a newsboy at twelve, gas company manager at twenty, chief engineer at thirty, millionaire at thirty-five, multi-millionaire at forty and many times a multi-millionaire at fifty-eight.

Fair-minded and patient in spite of a high-strung nature and tolerant toward everything except mental laziness, he is truly one of those who has helped to make America what it is. Simplicity is the keynote of his life, spurred, no doubt, by his boyhood worship of Lincoln.

In appearance Mr. Doherty has been cleverly described by a popular writer as having the "head and face of an artist—keen and somewhat deep-set eyes under a heavy thatch of pure white hair, worn rather long, with a full Van Dyke beard. He looks more the student or university professor than the practical hardheaded business man. On the other hand, his body is that of a mechanic—a raw-boned frame inherited, no doubt, from his Scotch ancestors. His hands are rather large, the fingers of which are remarkably spatulate and give to the observer the impression of the hands of a mechanic or master workman, which they are."

Mr. Doherty believes in developing men and in this he has been so successful that he is able at any time to step out from under the arduous task of running the $800,000,000 Cities Service organization, and know that the business will be carried on according to his principles.

# Affiliated Association Activities

## Wisconsin Utilities Association

A NOVEL feature of the Wisconsin Utilities Association's annual election of officers is the fact that the election is carried on by mail. This year 339 active members of the organization participated in the election.

*M. H. Frank*

The new officers are as follows: President, M. H. Frank, Wisconsin Power & Light Co., Madison; vice-president, A. J. Goedjen, Wisconsin Public Service Corp., Green Bay; treasurer, Ewald Haase, Milwaukee Gas Light Co., Milwaukee; chairman employees' education section, E. J. Steinberg, The Milwaukee Electric Railway and Light Co., Milwaukee; and vice-chairman employees' education section, R. G. Walter, The Wisconsin Power & Light Co., Madison.

Other section officers will be elected at separate conventions held during the year.

## Empire State Gas and Electric Association

ONE hundred and thirty accounting executives, statisticians and other office employees attended the two-day session of the Accounting Section of the Empire State Gas and Electric Association at Briarcliff Lodge, N. Y. Morris Tracy, of the Empire Gas & Electric Company, Geneva, chairman of the section, presided on the first day with J. R. Malone, of the New York and Queens Electric Light & Power Co., vice-chairman, presiding on the second day.

J. R. Malone was elected chairman and F. J. Brett, Buffalo, Niagara & Eastern Power Corp., was named vice-chairman.

E. H. Rosenquest, president of the Westchester Lighting Co., welcomed the meeting to his County.

C. E. Eble, of The Consolidated Gas Company of New York, spoke on "Mechanical Operation of Accounts Payable." The posting operations affecting accounts payable divided into groups, viz., vendor's invoices, petty cash, payrolls and the other, cash, were described for machine operation and the successful use of the machine after careful planning of interdepartmental activities were outlined. Ways and means of coordinating the work of the accounting treasury and auditing departments for a steady flow of work to the machine were given by the speaker.

J. J. Ward, Associated Gas & Electric System, reported as chairman of the Taxation Records Committee. He pointed out that in New York State there are twenty-seven distinct taxes which directly or indirectly affect the accounts of public utilities. Nine of the most important were carefully analyzed and the material necessary for recording these was described by the committee chairman.

Randall J. LeBoeuf, Jr., general counsel of the Niagara Hudson Power Corporation, addressed the meeting on the "Public Service Commission and the Accounting Practices of Public Utility Corporations." He pointed out that courts, commissions and companies alike have recognized that uniform systems of accounts and a degree of control over accounting methods are essential to proper commission regulation. The authority of commissions over the methods of computation and the amounts of all charges to operating expenses, accounts and credits to reserves for any purpose was outlined by the speaker as an usurpation of the powers of a board of directors and goes beyond what is proper regulating.

Other important subjects covered by prominent speakers included "Accident Prevention" by H. H. Judson, New York Edison Company; "The Accountant and the Public" by W. J. Welsh, president of the Empire State Gas and Electric Association; "The Accountant's Contribution to Merchandising" by H. C. Davidson, The Consolidated Gas Company of New York; "The Customer as an Individual" by Miss Ethel A. Conklin, The Consolidated Gas Company of New York.

A. R. Keller, Syracuse Lighting Company; J. Gordon Ross, Rochester Gas & Electric Corporation, and M. E. Brown, The Brooklyn Union Gas Company, presented papers on "Collection Methods and Their Effect on Public Relations." Clifford E. Paige, vice-president of the American Gas Association, delivered an address on "The Accountant and the Engineer." H. M. Brundage, vice-president of the Consolidated Gas Company, closed the meeting with some stirring and inspirational remarks.

## Pennsylvania Gas Association

AT the annual convention of the Pennsylvania Gas Association, held at Galen Hall, Wernersville, Pa., April 29, 30 and May 1, the following officers were elected for the ensuing year: President, E. G. Boyer, Philadelphia Electric Company, Philadelphia; first vice-president, H. Smyser Bair, York; second vice-president, L. W. Heath, Williamsport; third vice-president, Frank P. Duggan, Lewistown; secretary, Frank W. Lesley, York; treasurer, W. G. Sterrett, Jenkintown; managing director, A. B. Millar, Harrisburg.

*E. G. Boyer*

Council: G. W. Phillips, Sunbury; M. N. Bailey, Philadelphia; A. C. Taylor, Reading; H. H. Ganser, Norristown; M. A. Boylan, Scranton; James Moffatt, Pittston; E. W. Ehmann, Ardmore; Henry N. Diehl, Honesdale; W. G. B. Woodring, Allentown; A. S. Phelps, Stroudsburg; Luther Diehl, Chambersburg; Stanley Grady, Philadelphia; Warren A. Norris, *ex-officio*, Lebanon.

## Indiana Gas Association

ACCORDING to announcement made by F. W. Budd, secretary-treasurer, the Indiana Gas Association will hold its annual meeting at French Lick, Indiana, September 23 and 24. Heretofore, this association has held its annual meetings in the spring, but it has been changed this year to coincide with the Great Lakes Division of the N. E. L. A., whose meeting is scheduled for September 25, 26 and 27 at the same place.

## Mid-West Gas Association

AT the Silver Anniversary Convention of the Mid-West Gas Association, held in Waterloo, Iowa, April 14-16, J. M. Drabelle, of Cedar Rapids, was elected president of the association for the coming year. Other officers elected were as follows: J. K. Swanson, of Minneapolis, first vice-president; W. E. Derwent, of Rockford, Ill., second vice-president; R. B. Searing, of Sioux City, secretary-treasurer.

*J. M. Drabelle*

R. H. Garrison of Chicago, H. R. Schmidt of St. Paul, R. E. Taylor of Ottumwa, R. L. Klar of Des Moines, F. Milholland of Omaha, C. T. Williams of Sioux City, A. T. Barrett of Chicago, and P. J. Montgomery of Grand Forks, N. D., were chosen members of the council.

The following representatives of the Mid-West Gas Association were appointed to the Managing Committees of the various Sections of the American Gas Association: Accounting Section—W. E. Fenton, Iowa-Nebraska Light & Power Co., Lincoln, Nebr.; Commercial Section—E. J. Otterbein, Peoples Light Co., Davenport, Iowa; Industrial Gas Section—Martin Cogwin, Minneapolis Gas Light Co., Minneapolis, Minn.; Manufacturers' Section—S. G. Pugsley, Geo. M. Clark & Co., Cedar Rapids, Iowa; Publicity and

Advertising Section—H. D. Makeever, Peoples Gas & Electric Co., Mason City, Iowa; and Technical Section—J. F. McGuire, Union Light Heat and Power Co., Fargo, N. D.

## New Jersey Gas Association

THE annual convention of the New Jersey Gas Association was held April 25 at the Hotel Monterey, Asbury Park, N. J. More than six hundred men and women from all parts of the state attended this one-day meeting.

*Chester Grey*

Following an address by President R. A. Koehler, Major Alexander Forward, managing director of the American Gas Association, delivered an inspiring talk on the relation between the state and national associations, stressing the vital position the gas industry holds today.

S. Labert St. Clair, of the American Electric Railway Association, spoke forcibly on "What Publicity Can and Cannot Do," followed by W. H. Seely, of the Osborne Company, Newark, N. J., who talked from the point of view of the merchandise man. O. F. Potter, of Newark, N. J., closed the morning session with the report of the Committee on Merchandise Accounting.

The afternoon program consisted of four papers, as follows: "Oil Fog Lubrication of Gas Mains" by W. L. Shively, research engineer of the Koppers Company, Pittsburgh, Pa.; "Accident Prevention" by A. J. Van Brunt, Newark, N. J.; "The Manufacturer's Viewpoint" by E. S. Dickey, vice-chairman of the Manufacturers' Section of the American Gas Association; and the Report of the Industrial and House Heating Committee, by H. A. Sutton of Newark, N. J.

The following officers were elected for the coming year: President, Chester Grey, Atlantic City Gas Company, Atlantic City; first vice-president, Louis Stoecker, Public Service Electric and Gas Company, Newark; second vice-president, J. D. Alden, Jersey Central Power and Light Company, Asbury Park; secretary-treasurer, Herbert E. Cliff, Public Service Electric & Gas Co., Newark.

## Canadian Gas Association

ACCORDING to G. W. Allen, secretary of the Canadian Gas Association, there will be many papers covering subjects of vital interest to gas men in attendance at the convention of that association to be held at Halifax, N. S., June 24 and 25.

Some of the topics to be discussed by outstanding speakers will be: "Construction of Pipe Lines for the Distribution of Gas," by J. A. Messenger, engineer of distribution, United Engineers and Constructors, Inc., Philadelphia; "Experiences with Automatic Water Gas Operation," by John Keillor, engineer, gas division, British Columbia Electric Power & Gas Co. Ltd., Vancouver; "House Heating with Manufactured Gas" by Roy Soderland, Ottawa Gas Company; "Major Changes at Quebec" by J. C. Dawson, assistant superintendent, gas department, Quebec Power Company; "Pipe Joint Research at the American Gas Association Laboratory" by R. M. Conner, director, Testing Laboratory, Cleveland; "New Business Developments at Halifax, N. S." by B. G. Edens, assistant sales manager and H. G. Stairs, gas sales engineer, Nova Scotia Light & Power Co. Ltd., Halifax; "Coal Gas from High Sulphur Coals at Halifax" by K. L. Dawson, president, Canadian Gas Association, and superintendent and sales manager, Nova Scotia Light & Power Co. Ltd., Halifax; "Dehydration of Gas with Special Reference to Experience with Compression Methods in Small Plants" by W. S. Dole, gas engineer, Federal Light & Traction Co., New York City; "Stereotype Metal Melting" by N. E. Bertl, Consolidated Gas Company of New York.

*Lord Nelson Hotel, Halifax, N. S.*

Convention Headquarters will be at the Lord Nelson Hotel. Entertainment features are taken care of and include the annual dinner and inspection trips.

## Missouri Association of Public Utilities

H. M. PATTON, district superintendent of the Union Electric Light & Power Co., St. Louis, Mo., was elected president of the Missouri Association of Public Utilities for the coming year at the annual State convention of the association, held May 1, 2, and 3 at Springfield, Mo. He succeeded Major T. J. Strickler, general manager of the Kansas City Gas Co.

Other officers elected were: First vice-president, A. E. Bettis, Kansas City Power & Light Co.; second vice-president, Fred Karr, St. Joseph Gas Co.; third vice-president, Worth Bates, Missouri Gas & Electric Service Co., Lexington, Mo.; treasurer, Hermann Spoehrer, Union Electric Light & Power Co., St. Louis, Mo.; secretary, F. D. Beardslee, Mercantile-Commerce Bank & Trust Co., St. Louis, Mo.; assistant secretary, Jesse Blythe, Jefferson City, Mo.

Major T. J. Strickler, retiring president, was elected a member of the Executive Committee. Other members of the Executive Committee re-elected were as follows: A. E. Reynolds, Springfield, Mo.; W. H. Henby, University City, Mo.; Hermann Spoehrer, St. Louis, Mo.; L. P. Andrews, Sedalia, Mo.; C. A. Semrad, St. Joseph, Mo.; Chester C. Smith, Kansas City, Mo.; S. W. Greenland, St. Louis, Mo.

This year's convention was the largest the Association has ever held. A large number of delegates were accompanied by their wives. A special entertainment program was arranged for the visiting ladies.

An address of welcome was delivered by Mayor T. H. Gideon, of Springfield. The response was given by A. E. Reynolds, vice-president of the Springfield Gas & Electric Company, and past president of the association.

Among others, addresses were made by Milton R. Stahl, Jefferson City, Mo., Chairman of the Missouri Public Service Commission; Charles Gordon, New York City, Managing Director of the American Electric Railway Association; and Dr. E. A. White, Chicago, Ill., director of the National Committee on the Relation of Electricity to Agriculture.

The annual banquet and carnival were held on the night of May 2 at the Shrine Mosque. The principal address was made by Earle W. Hodges, of New York City, director of public relations of Henry L. Doherty & Co.

An Open Forum on May 2 proved successful and many questions of importance to the utility industry were discussed. The leaders of the discussion were: "Electricity," J. E. Hillemeyer, Union Electric Light & Power Co., St. Louis; "Gas," Fred Karr, St. Joseph Gas Co.; "Electric Railways," Barney W. Frauenthal, St. Louis Public Service Co.; "Water," W. H. Henby, St. Louis County Water Co., University City, Mo.

The place of holding the next annual convention will be selected by the Executive Committee at its meeting in June.

## Southern Gas Association

THE annual convention of the Southern Gas Association and Regional Sales Conference will be held in Savannah, Georgia, June 10 to 13 with "Promotion of New Business" as the keynote. General sessions will take place in the mornings while the sales conferences will convene in the afternoons.

Many interesting subjects are scheduled to be treated on the program. At the session on the afternoon of June 10, the following papers will be presented: "Meeting Electric Competition in Range Sales," by Bob Dougherty, Jacksonville Gas Co., Jacksonville, Fla.; "Home Service as a Gas Sales Aid," by Miss Jessie

# Convention Calendar

New York Regional Sales Conference,
Lake Mohonk, N. Y.
June 5-7.

Southern Gas Association & Regional Sales Conference,
Savannah, Ga.
June 10 to 13.

New England Regional Sales Conference,
New London, Conn.
June 12-14.

National Electric Light Association,
San Francisco, Calif.
June 16-20.

World Power Conference,
Berlin, Germany.
June 16-20.

Domestic Gas Appliance Course, American Gas Association Testing Laboratory,
Cleveland, Ohio.
June 16-21.

Wisconsin Utilities Association, Accounting Section,
Eau Claire, Wis.
June 19-20.

American Electric Railway Association,
San Francisco, Calif.
June 23-26.

Canadian Gas Association,
Halifax, N. S.
June 24 and 25.

Pacific Coast Gas Association,
Annual Northern Conference,
Seattle, Wash.
June 26 and 27.

Michigan Gas Association,
Grand Hotel, Mackinac Island, Mich.
June 30, July 1, and 2.

Home Service Summer Course, Columbia University,
New York, N. Y.
July 7-25.

Wisconsin Utilities Association, Commercial Section,
Greenbay, Wis.
July 31 and Aug. 1.

Pacific Coast Gas Association,
Hotel Huntington, Pasadena, Calif.
Sept. 9-12.

Empire State Gas & Electric Association,
Saranac Inn, N. Y.
Sept. 18 and 19.

Indiana Gas Association,
French Lick, Ind.
Sept. 23-24.

Illuminating Engineering Society,
John Marshall Hotel, Richmond, Va.
Oct. 7-10.

American Gas Association, Municipal Auditorium, Atlantic City, N. J., October 13-17, Alexander Forward, 420 Lexington Avenue, New York, N. Y., Managing Director.

New England Gas Association,
Hotel Statler, Boston, Mass.
Feb. 3, 4, and 5, 1931.

McQueen, American Gas Association, New York, N. Y.; "Home Service from the Management's Viewpoint," Charles Leach, Macon Gas Co., Macon, Ga.; Speakers on "Proper Accounting for Sales Promotion Activities" and "Promoting Better Business Contacts by all Employees" will be announced later.

On the afternoon of June 11, Stanley Jenks of Hammond, Ind., chairman of the Water Heating Committee of the American Gas Association, will discuss "Water Heating a Major Activity"; E. W. Avegno, New Orleans Public Service Commission, will present "Automatic Water Heaters"; and F. J. Simpson of the Hurley Machine Company is scheduled to present "Laundry Equipment Sales Possibilities in the South."

The afternoon session of June 12, will be devoted to the following topics:

"Future of Refrigeration by Gas," by R. R. Guenther, Electrolux Sales, Inc., Evansville, Ind.; "Relative Value of Various Advertising Media," by M. M. Scott of the Ruud Company; "Cooperative Regional Advertising," R. C. Hoffman, Central Public Service Commission, Atlanta, Ga.; "Increasing Gas Sales per Customer," S. L. Drumm, New Orleans Public Service Commission, New Orleans, La.

Friday, June 13, will be given over to presentation and discussion of the following subjects:

"Space and Building Heating," Lyle C. Harvey, Bryant Heating Company; "Conversion Burner Sales Methods," Milliard J. Roberts, Roberts-Gordon Appliance Co., Buffalo, N. Y.; "Space Heating Sales Possibilities," by Kenneth Clow, Clow Gasteam Heating Company, Jacksonville, Fla.; and "The Market for Unit Heaters," Hubert Humphrey, General Gas Light Co., Kalamazoo, Mich.

## Natural Gas Men Favor Conservation

(Continued from page 242)

pointed out the advantages and the possibilities of such a development. He states that research is now under way to determine the fundamental factors with greater accuracy and to develop mechanical equipment and cooling media that will be reliable and that can be operated simply, and further states that research of this character has the endorsement of the American Gas Association, acting for the gas industry, and that the executive board of that organization has instructed a committee on industrial gas research to lend every encouragement to its energetic prosecution.

"Many of us are familiar with the time and money that have been required to develop a gas refrigerator and are hopeful that a house cooling unit may be developed within a short time.

"If it is possible through the activities of the research department to develop off-peak uses for domestic gas, then the entire revenue derived from such uses, less the cost of gas purchased, will be correspondingly reflected in a similar increase in the net revenues of the industry.

"Your chairman believes that now is the time to provide funds for further increasing the activities in the research and developing of house cooling devices and other off-peak uses for gas, but is not unmindful of the fact that such funds cannot be provided from the present American Gas Association budget, for the reason that so many companies are changing from manufactured to natural gas. This situation presents a serious loss to Association revenue since the gross revenue of the companies are usually sharply reduced because of lower rates and because the companies then pay to the Association on the lower natural gas dues basis so that the organization loses twice by the same operation, in changing from manufactured to natural gas. I know that the loss to the Association by this process is not yet serious, but that it soon will be, to the extent of crippling the organization's activities and reducing the money available for research, is obvious.

"And now, notwithstanding that the natural gas industry is the direct means by which the Association's finances are being lessened, I believe that the Natural Gas Department

(Continued on next page)

# Personal and Otherwise

**H. G. Scott,** president of the Memphis Natural Gas Company and Appalachian Gas Corporation, has been elected to the directorate of Allegheny Gas Corporation.

**John Franklin Dodge,** fuel engineer of the Standard Oil Company of California and an authority on gas conservation, has been named professor of petroleum engineering in the College of Engineering of the University of Southern California.

**Floyd J. Tucker,** new business representative of the Kansas City Gas Company, has succeeded C. B. Wilson as house heating engineer of the Joplin Gas Company.

**E. C. Whitcomb** has been placed in charge of the appliance department recently organized by the Fort Worth Gas Company. A sales force of four salesmen and a house heating engineer have been placed under Mr. Whitcomb's direction. They are: W. B. Yeats, W. E. Smith, A. L. Chesney, A. B. McDonald, and Vernon R. Brown.

**George A. G. Wood,** formerly executive vice-president of the Massachusetts Gas Companies, has been elected president of the Washington Gas Light Company, Washington, D. C., succeeding Ord Preston.

**L. B. Smith** has been made district manager of the Northern Indiana Fuel & Light Company to succeed T. M. Swain who has been transferred to another territory.

**H. O. Grainger** has succeeded J. W. Campbell as local manager of the Oklahoma Gas and Electric Company, at Hennessey, Okla.

**Thomas F. Rowe** has been promoted by the Associated Gas and Electric System to the position of division auditor of the New York State Electric and Gas Corporation.

**W. Hayes,** supervisor of the Gas Light & Coke Company, Ltd., will be one of a group of men making a tour of industrial plants in the United States, in the interest of the Industrial Welfare Society of Great Britain.

**Curtis H. Fisher,** former district manager for the Gulf Cities Natural Gas Company at Goose Creek, Texas, has been made manager of the consumer service for the Houston Natural Gas Company.

**A. W. Ambrose,** manager of the oil production division and the geographical and land departments of Empire Gas and Fuel Company, has been elected vice-president.

**I. L. Land,** formerly of the Houston Natural Gas Company, has been appointed district manager for the Alvin, Angleton and Danbury plants of the Texas Natural Gas Utilities Company. For four years before entering the employ of the Houston Gas Company, Mr. Land was connected with the Municipal Gas Company at Denton and Wichita Falls.

**W. M. Cates,** of the West Texas Gas Company, has been transferred to the managership of the Slaton office. E. B. Carroll, former local manager at Slaton has been transferred to Plainview.

**H. C.** and **H. E. Beaven,** contractors and engineers, have announced the removal of their office to 101 Park Avenue, New York City.

**A. G. Packwood,** formerly commercial manager of the Illinois Power and Light Company, at Mount Vernon, is now in the same capacity with the Central States Gas Company at Anderson, Ind.

**Ralph P. Smith** has been appointed superintendent of gas manufacture, Connecticut Power Company, to succeed J. J. Dowling who is now assistant to the manager.

**F. C. Walters** has been appointed superintendent of city distribution plants of the Oklahoma Natural Gas Corporation to succeed E. A. Clark, resigned.

**Francis E. Kester,** assistant secretary and assistant auditor of Southern Counties Gas Company, recently resigned his position.

**B. R. Muirhead,** formerly assistant treasurer of the Arkansas Natural Gas Corporation, has been named treasurer of that organization.

**John Eoghan Kelly,** consulting engineer of New York, has been elected director and vice-president of Midland Natural Gas Company, a merger of twenty-seven natural gas and petroleum producing properties located in West Virginia and Pennsylvania.

## Natural Gas Men Favor Conservation

(Continued from page 264)

should urge the expenditure of additional funds for research work in house cooling and in other methods of adding sales which will improve load factors. For this purpose I recommend the appointment of a committee of the Natural Gas Department to study the subject and to make recommendations to the meeting in Atlantic City in October as to what natural gas dues should be paid.

"It has been my privilege to serve as your chairman for the past six months and of this honor I am deeply conscious. My appreciation and gratitude is extended to our Secretary, Mr. Stephany, our Vice-chairman, Mr. Cooper, our Managing Director, Major Forward, and to all committee members who at all times responded to the call and, typical of our industry, were not found wanting."

### GAS CONSERVATION RESOLUTION

**WHEREAS, There is a growing appreciation on the part of those engaged in the natural gas industry, of the value and necessity for more rigid and efficient conservation of this natural resource; and**

**WHEREAS, It was recommended by Mr. W. A. Jones, at the annual meeting in Kansas City, in 1929, that definite steps be taken by the industry to ascertain so far as possible the loss of natural gas by unnecessary wastage, inefficient operation methods, uneconomic usage and to proceed with methods, both within and outside the industry to minimize such waste, and**

**WHEREAS, The unusual increase in gas production and the unprecedented development of main transmission pipe lines into territory hitherto unacquainted with natural fuel, and the indications of continued developments of this nature, has brought this fuel and the industry responsible for its recovery, transmission and distribution to the consuming public, more completely into the public eye than ever before in the history of its use, thereby enhancing in every way the value of natural gas;**

**BE IT RESOLVED, That we, the committee on natural gas conservation, appointed as the result of action taken by the Natural Gas Convention, in Kansas City, Missouri, in 1929, to make a study of this matter, and formulate recommendations thereupon for this convention, do recommend and urge that this problem of natural gas conservation be made the subject of an intensive study and survey by our Main Technical and Research Committee through such agencies and with such cooperation from the United States Bureau of Mines and others as it may select, and report a definite plan at the meeting of the Natural Gas Department of the American Gas Association at its annual convention in Atlantic City in October, 1930.**

## Publicity and Advertising Section

JAMES M. BENNETT, Chairman ALLYN B. TUNIS, Secretary DONALD M. MACKIE, Vice-Chairman

# Household Information Service Latest A. G. A. Activity

A NEW service and one which has been much needed for some time, the Household Information Service, under the direction of Miss Marie Hulser, has been added to the other staff activities of the American Gas Association Headquarters, New York.

This new service, which will become effective July 1, 1930, will consist of a monthly proof or press sheet, available to all member companies of the American Gas Association, containing articles and illustrations for use in the woman's pages of newspapers in every community where gas is distributed. In addition to the proof sheets, which will be published in duplicate, one set of matrices of both illustrations and text will be furnished monthly with each subscription for the service, for local use of the subscriber.

A nominal fee will be charged for this service calculated to defray the absolute cost of preparation, and to support, at least in a measure, the development of a similar service for the household and women's magazines of national circulation, for which service there is a growing demand, and from the standpoint of our industry, certainly a most imminent need.

Miss Hulser, who will edit this new service, comes to the Association after several years in this field of informational news service, the past two years having been associated with the national headquarters of the "Save The Surface Campaign," in the capacity of educational publicity, and editor of that organization's syndicated magazine. Previously she was associated with the *New York Daily News* and the publicity department of Columbia University, having been engaged in newspaper or educational publicity work in some form since her graduation from Flushing (N. Y.) High School.

Members of the American Gas Association should be interested to know that this program of educational publicity directed to the home-maker, who is the purchaser of about 85 per cent of our domestic gas sales, is going to be a regular part of the program of disseminating information about gas and gas appliances.

Further detailed information about the service, the subscription price, etc., may be had by addressing *Household Informaton Service,* care Miss Marie Hulser, or Keith Clevenger, Director, Publicity and Advertising, American Gas Association, 420 Lexington Avenue, New York.

*Miss Marie Hulser*

## Two New Phillips Companies

THE formation of two additional companies, the Phillips Natural Gas Company and the Phillips Petroleum Utilities Company, recently were announced by Frank Phillips, president of the Phillips Petroleum Company.

## New Publication to Aid Industrial Gas Sales

*Better Heat* is the name of a new four-page illustrated periodical that is now being published by The Consolidated Gas Company of New York to stimulate the use of gas for industrial heating operations, and to supplement the work of the industrial salesmen.

*Better Heat* is an extremely flexible mailing piece, and represents the development of a new wrinkle in publications of this nature, according to Henry Obermeyer, assistant to the vice-president of the company. The first two pages are devoted to a discussion of a specific heating problem in the reader's own line of business.

## Mr. Lucey Takes Post at Shanghai

ACHESON LUCEY, for two years connected with the Advertising and Display Department of The Consolidated Gas Company of New York, resigned to accept a position with the American Asiatic Insurance Company, and will make his headquarters in Shanghai, China.

Mr. Lucey will be in charge of the company's advertising in the Orient, and will also be business manager of the *Evening Post,* the American newspaper published in Shanghai.

Mr. and Mrs. Lucey sailed for the Orient the latter part of last month.

## Byllesby Promotions

JOHN J. O'BRIEN, president of H. M. Byllesby and Company, announces that J. F. Gardiner has been appointed advertising and publicity manager of H. M. Byllesby and Company.

W. H. Hodge, vice-president and manager Sales and Advertising Department, of the Byllesby Engineering and Management Corporation, announces the following departmental changes:

T. P. Pfeiffer has been appointed advertising manager of the Byllesby Engineering and Management Corporation and Standard Gas and Electric Company.

J. W. Hicks has been appointed publicity director of the Byllesby Engineering and Management Corporation and Standard Gas and Electric Company, also remaining in charge of the publications of these companies issued for executives, employees, etc.

## Technical Section

B. V. PFEIFFER, Chairman H. W. HARTMAN, Secretary R. G. GRISWOLD, Vice-Chairman

# Many Attend Distribution Conference

INCREASED attendance marked the annual Distribution Conference held at St. Louis, April 9-11, when more than 450 gas engineers, chemists and equipment manufacturers met. A conspicuous feature of the meeting was the unusual amount of interest manifested by the large number of natural gas engineers present. The vast expansion program and long-distance transportation of gas has created great interest in all distribution problems.

The program consisted mainly in committee reports, papers and lively discussions which brought out the intensive research and exhaustive study being carried on in this phase of the gas industry.

Among the outstanding papers presented at this meeting was that of Dr. Scott Ewing, American Gas Association Research Associate, Bureau of Standards, Washington, D. C., entitled "The Preparation and Burial of the Specimens for the American Gas Association Coating Tests." Inasmuch as copies of Dr. Ewing's paper were not available at the conference, it is printed below:

The investigation of protective coatings for pipe lines, which the American Gas Association and Bureau of Standards have made possible, started one year ago. Numerous organizations and individuals who are interested in these tests are anxious to know what coatings are being tested and where the specimens have been buried. For this reason it seems desirable to describe the coatings in as detailed a manner as possible with the information at hand, and to give a general description of the places of burial.

A few articles and reports on the progress of the work have appeared in the various gas journals, the last and most complete report so far published being in the A. G. A. MONTHLY of last August. The reasons for the method of attack which has been chosen are set forth in this article and may now be very briefly reviewed.

The work of preparing a large number of specimens, such as has been done in the investigation sponsored by the A. G. A. is expensive. It is entirely proper therefore, to list some of the advantages of this method and show why the expenditure is justified. (1) There is no question as to how the coating was applied. The coating manufacturer has every advantage it is possible to give him so that failure cannot be easily attributed to faulty application. (2)Samples of the material are obtained at the time of application so that there is no question as to the nature of the original material. (3) The pipes were bright so that if rust appears on them later, it certainly has formed since the coating was applied. (4) The coatings do not have to be inspected in the bottom of a dark trench but will be brought to the laboratory where they can be referred to at any time in case any question should arise. In the laboratory they can be carefully studied so that it should be possible to get definite information as to just what happened to the coating while it was underground. (5) Laboratory tests can be made on the coatings with the object of developing a satisfactory method of test which may be applied to any coating at any future time. (6) By burying specimens we have wide choice of locations for burial and we can bury the specimens in the particular soils we are interested in, thus getting direct comparisons between different coatings in the same soils and the same coatings in different soils. The one essential thing that must be obtained in any investigation is adequate data. If the conclusions are to be definite and reliable, they must be based upon sufficient data so that one is not misled by accidental circumstances. Such circumstances are especially apt to occur in studying corrosion and its prevention.

There are hundreds of miles of coated pipe lines in the field. Inspection of these lines is perhaps the most direct and apparently the simplest way of obtaining information as to the merits of the various coatings, but some of the needed information cannot be obtained in this way. Dr. Gordon N. Scott, the Petroleum Institute Research Associate at the Bureau of Standards, has spent over a year in just this kind of work and he will give you a summary of his findings and the merits of this method.

### II. METHODS OF APPLICATION OF THE COATINGS

#### 1. *General Description of the Test*

All of the more important coating manufacturers were invited to enter the test and submit as many coatings as they desired. Among other things the manufacturers were required to pay a fee of $200 for each coating they wished to test. This money is to be used to help defray those expenses which vary with the number of coatings such as cost of application, freight, and cost of cleaning and rating the specimens. Fixed costs, such as salary and traveling expenses, are to be paid by the American Gas Association. This fee requirement served two distinct purposes. (1) It limited the number of coatings to those in which the manufacturers had considerable faith. (2) It provided a means of preventing the American Gas Association and the Bureau of Standards from being overburdened with the expense of the test.

Manufacturers shipped their coating material to the Galvanizing Plant of the National Tube Company; a schedule was arranged and each manufacturers' representative came there to supervise the application of his coating. The coatings were applied to shot-blasted pipes which were stored in a bin of lime to prevent them from rusting.

#### 2. *List of Coatings Tested and Methods of Application*

Table 1 is a list of the coatings in the test and some data concerning them. For the purpose of describing them in more detail the coatings have been divided into six classes in the following paragraphs.

a. *Bituminous enamels* are materials defined as having 15-40 per cent by weight of finely divided mineral fillers. Coatings which are ordinarily called enamels consist of a priming coat of a solution of bituminous substance and a coating of the enamel proper applied with a sling. Coatings B, H, R, S, W, and WR (Table 1) fall into this class. The descriptions of these materials, as submitted by the manufacturers, show that they are all different, both as to the kind of filler added and as to the physical properties of the product. All of these coatings had an electrical resistance greater than one megohm between the pipe and the water into which the specimen was dipped. The method of determining the resistance of the coating will be described later.

b. *Asphalt emulsions* consist of a liquid (water) phase in which the asphalt is dispersed by means of some emulsifying agent. The asphalt emulsions are all applied cold and most of the water evaporates leaving the asphalt on the pipe. Coatings E, EE, F, FF and G are in this class. Coating E contains asbestos fiber, EE had Portland cement dusted on it before the water evaporated and FF had Portland cement mixed with the coating material before it was applied. E, FF and G were applied with a brush, EE was applied by dipping full length pipe and F by dipping 2-foot lengths of pipe in the emulsion. All of these coatings had a comparatively low electrical resistance when the cans were placed on them, and they appeared to conduct the current at every point.

c. *Cut-backs* consist of the bituminous substance dissolved in a light petroleum distillate or coal tar solvent which evaporates when the coating is applied. Coatings K, L, M and SS belong in this class. All of them were applied cold with a brush. Coatings K and SS have coal tar base material with a filler, L has asphalt base material with asbestos fiber in it and M has asphalt base material and no filler. They all consist of a priming coat and one or two outer coats of thicker material. Most of these materials dry rather slowly from the outer surface inward, and are not hard enough throughout to resist slight abrasions after several days. They are rather thin and in most cases if applied to greater thickness the material runs off the pipe. All of the cut-backs except L showed numerous leaks with the electrical test so that their resistance is rather low. Coating L dried to a rather hard, tough coating in one day and showed only 5 leaks in the 60 specimens. These leaks were repaired.

d. *The felt reinforced coatings* can best be described by further subdividing this class into four groups, based upon the methods that were used in their application. Coating BB was applied by hand, the pipe being rotated on saw horses while the felt was wrapped and sealed to the pipe by pouring molten pitch on it. Similar operation was used to put on the Kraft paper.

Coatings X and P were applied with the Pabco machine. The pipes were driven spirally through the machine and the felt was drawn through a bath of hot asphalt and on to the primed pipe. If desired, Kraft paper can also be wrapped on the pipe in the same operation with this machine. It was used on the P coating but not on the X.

Coatings T, U and Z were applied with the Hill, Hubbell machine. In this machine the pipe lengths are coupled together with special couplings and supported on "dollies." These travel on a track so that a continuous stream of pipe passes spirally through the machine. The primed pipe is bathed in molten bituminous substance which flows from an overhead tank onto a sling held under the pipe. A pump keeps the overhead tank full of hot bituminous substance. Another stream flows over the felt as it is wound on the pipe, and a third stream flows onto a second sling which coats the felt wrapped pipe. Kraft paper is then wrapped on the pipe. Ordinarily this is all done in one operation, but due to the flexibility of the 2-inch pipe which size is seldom coated by this method, better results were obtained by coating the pipe for the test in two operations. However, only one operation was needed for coating U as the Kraft paper was wrapped on top of the felt without a second slinging operation.

Coatings CC, J, JJ and WF were applied with a lathe-type machine in the Galvanizing Plant of the National Tube Company. The pipe rotates in a lathe as a carriage moves along the pipe. The rolls of felt are mounted on the carriage. A pump could have been attached to the carriage to pump the hot bituminous substance on the felt as it was wrapped on the pipe, but the cost of cleaning the machine would have been greater than that of pouring the bituminous substance on the felt by hand. For this reason the latter method was used with the coatings that were prepared for these tests. The pipes for the CC coating were preheated and brushed with hot asphalt and then wrapped. Those for the WF coating were primed and coated with Bitumastic enamel by means of a sling before they were wrapped, those for the J and JJ coatings were primed, wrapped and then coated with the bituminous substance with a sling.

Without exception all of the felt reinforced coatings showed an electrical resistance greater than one megohm. The time required to apply most of these coatings was considerably greater than it would be in actual practice because it was not economical or even possible to get the equipment in good working order when only 120 feet of pipe were coated. Nevertheless the time required indicates that all of these coatings are practical and that their costs of application are not prohibitive.

e. *The cotton fabric reinforced coatings* are divided into hand-applied and machine-applied coatings. The hand-applied coatings include D, DD, MM, V, VX, VV, and Y. The machine-applied coatings include LL, N, NL, NS, and Q. For all of the hand-applied cotton fabrics except MM the pipe was rotated and the roll of fabric held at the proper angle so that it wrapped on the pipe. For the MM coating the roll was passed around the stationary pipe. The coatings V, VV, VX and Y were applied by gas companies at their coating plants. The preheated pipe was placed on rolls over a trough of molten asphalt. Asphalt was poured over the pipe and the cotton fabric was wrapped on while the pipe was hot. Another layer of asphalt was then poured over the fabric.

In all the machine-applied cotton fabric reinforced coatings, the lathe-type wrapping machine, which was described under felt reinforced coatings was used. The LL and Q coatings were applied cold while for all the others the cotton fabric passed through molten asphalt before it went on the pipe.

None of the hand-applied coatings in this class were covered with paper, the fabric in all cases being coated with the coating material. All of the machine-applied coatings in this group except Q and NS were covered with an outer fabric of paper. Q had no outer fabric on it and NS was wrapped with 30 gauge sheet steel.

None of the gas company coatings were tested for electrical resistance and the NS coating could not be tested because the steel shell was in contact with the pipe at the ends of the specimens. All of the remainder of the coatings in this group except Q showed a resistance greater than 1 megohm. The Q coating material is not a conductor but there were numerous pinholes in it.

f. *Miscellaneous coatings* which do not fall into the above classes are A, C, WL, WW and NT. All of these coatings were applied hot. They were all applied with a sling except C and NT. In applying coating C the full length, preheated pipe was dipped in the molten coating material which has an asphalt base. Coating NT is an asphalt mastic containing a high percentage of mineral filler. This was extruded on pipe that was previously dipped in low melting point asphalt. At the present time this is strictly an experimental coating. Coating A does not contain a filler and has a coal tar base. WL and WW are both Bitumastic enamel, the first being applied to pipe that was painted with red lead and the second being covered with a shell of wood veneer .05 inch thick. All of these coatings had an electrical resistance greater than one megohm when the specimens were prepared.

### III. Preparation of the Specimens

After the full length pipe was coated, it was cut in 2-foot lengths by means of a threading machine and a three-wheel pipe cutter. Each specimen was then marked in 4 places with the letter designating the coating and a number. Sixty specimens of each coating were made and they were numbered from 1 to 60. Tin cans were sealed on the ends of the specimens with whatever sealing material the manufacturer thought best, and they were sealed so that the pipe was not in contact with the can. The cans serve several purposes: They cover up the ends of the specimens so that moisture cannot creep under the coating, and the coating is exposed in the same way it would be exposed on an actual line. They prevent the soil and water from entering the pipe and corroding it on the inside. They support the pipe in the trench so that it does not rest on the bottom of the trench, which is the way an actual pipe line lies over the greater part of its length. They take all the wear and tear of shipment, for the coated pipe cannot touch anything while it is in the shipping box. They make it possible to determine the approximate resistance of the coating.

After one can was sealed on one end the specimens were tested for electrical resistance. If there was conduction due to pinholes caused by faulty application, the holes were repaired. If the holes were so numerous that they appeared to be characteristic of the coating, no attempt was made to repair them. The method of making this test for electrical resistance consists of dipping the specimen in an iron tank full of water so that the specimen was almost completely immersed. One terminal of a dry cell is connected to the metallic container; the other was connected to the pipe through a 1000-ohm resistance and a milliammeter having a full scale deflection of one milliampere. The deflection of the milliammeter for each specimen was recorded. The 1000-ohm resistance is for the purpose of protecting the instrument in case the coating has a very low resistance. After the other can was placed on the specimens they were packed in boxes and shipped to the places of burial.

TABLE 1

PIPE COATINGS IN AMERICAN GAS ASSOCIATION TESTS

| Symbol | Manufacturer or Agent | Method of Applying Primer | Trade Name of Primer | Method of Applying Coating | Trade Name of Coating | Fabric Reinforcement if any | Man hrs. to apply coatg. | Av. Temp. of Appln. | Av. Thickness in. |
|---|---|---|---|---|---|---|---|---|---|
| A | American Tar Products Co. | Brush | A. T. P. Primer | Sling | A. T. P. Pipe Coatg. No. 1 | ——— | 2.8 | 380 | .070 |
| B | Barrett Co. | Brush | B. P. L. Primer | Sling | B. P. L. Enamel | ——— | 4.0 | 350 | .038 |
| BB | Barrett Co. | Brush | B. P. L. Primer | Hand | Pitch & Felt | *15 lb. rag felt | 4.5 | 370 | .134 |
| C | Benjamin Foster Co. | Dipped no other treatment | | | I. B. M. Pipe Coating | ——— | 3.0 | — | .014 |
| CC | Benjamin Foster Co. | Brush-hot | I. B. M. No. 1 | Machine | I. B. M. No. 2 | 15 lb. asbestos | 7.5 | 375 | .120 |
| D | Dearborn Chemical Co. | Brush | No-Ox-Id A special | Hand | No-Ox-Id G | No-Ox-Id muslin | 7.5 | cold | .054 |
| DD | Dearborn Chemical Co. | Brush | No-Ox-Id G special | Hand | No-Ox-Id GX+G | No-Ox-Id muslin | 10.5 | 280 | .071 |
| E | Emulsion Process | Brush | E. P. No. 1 | Brush | Parafait | ——— | 4.0 | cold | .047 |
| EE | Consolidated Gas Co. of N. Y. | Dipped and dusted with cement | | | Armored Hydralt | ——— | 1.8 | cold | .0605 |
| F | Flintkote Co. | Dipped vertically, no other treatment | | | A. C. E. | ——— | 4.0 | cold | .082 |
| FF | Flintkote Co. | Brush | A. C. E. + cement | Brush | A. C. E. + Cement | ——— | 4.0 | cold | .029 |
| G | Headley Good Roads Co. | Brush | Headley No. 11 | Brush | Headley No. 11 | ——— | 3.75 | cold | .016 |
| H | Hill, Hubbell & Co. | Brush | Inhiburine | Sling | Biturine | ——— | 2.0 | 470 | .034 |
| I | Johns-Manville Corp. | Brush | J. M. Tar Primer | Machine | J. M. Pitch No. 2 | 14 lb. asbestos | 6.7 | 350 | .163 |
| IJ | Johns-Manville Corp. | Brush | J. M. Asphalt Primer | Machine | J. M. Asphalt | 14 lb. asbestos | 7.5 | 475 | .126 |
| K | Arco Company | Brush | Arco Ravenite | Brush | Save-a-line | ——— | 3.5 | cold | .009 |
| L | Barber Asphalt Co. | Brush | Plastic Pipe Ctg. | Brush | P. P. C. | ——— | 2.7 | cold | .024 |
| LL | Barber Asphalt Co. | Brush | Genasco Primer | Machine | ——— | *Sat. cotton shetg. | 5.8 | cold | .056 |
| M | McEverlast, Inc. | Brush | Penetration | Brush | Electrolysis Proof | ——— | 4.3 | cold | .010 |
| MM | McEverlast, Inc. | Brush | Penetration | Sling & Hand Wrap | M. P. C. | Osnaburg | 5.5 | 375 | .080 |
| N | National Tube Co. | Dipped | Robertson No. 228 | Machine | National Coating | *Muslin | 6.0 | 380 | .146 |
| NL | Lead Industries Assn. | Brush | Red Lead | Machine | National Coating | *Muslin | 6.25 | 380 | .117 |
| NS | National Tube Co. | Dipped | Robertson No. 228 | Machine | National Coating | Muslin and steel | 16.0 | 382 | .147 |
| NT | National Tube Co. | Dipped | Robertson No. 228 | Extruded | Robertson No. 230 | ——— | —— | 340 | .131 |
| P | Paraffine Companies, Inc. | Brush | Pabco No. 440 | Pabco Mach. | Floatine | *Pabco Felt | 2.2 | 350 | .123 |
| Q | Albrecht Pagenstecher | Wrapped, no other treatment | | Machine | Schades Wrapper | Schades Wrapper | 6.0 | cold | .051 |
| R | Resistoor Engineering Corp. | Brush | Resist. Primer | Sling | Resistoor Enamel | ——— | 2.0 | 400 | .061 |
| S | Sherwin-Williams Co. | Brush | Lyne-Kote Primer | Sling | Lyne-Kote Hot | ——— | 2.0 | 420 | .034 |
| SS | Sherwin-Williams Co. | Brush | Lyne-Kote Primer | Brush | Lyne-Kote Cold | ——— | 3.0 | cold | .007 |
| T | Texas Co. | Brush | Texaco Primer | Machine | Asphalt | *15 lb. rag felt | 8.3 | 450 | .150 |
| U | Hill, Hubbell & Co. | Brush | Inhiburine | Machine | Biturine Spec. A-1 | *30 lb. rag felt | 3.6 | 425 | .214 |
| V | Iroquois Gas Corp. | Brush | Robertson No. 274 | Hand | Robertson Asphalt | Cheesecloth | 2.6 | 420 | .070 |
| VV | Iroquois Gas Corp. | Brush | Robertson No. 274 | Hand | Std. N. J. Brick Filler | Cheesecloth | 3.0 | 410 | .038 |
| VX | Iroquois Gas Corp. | Brush | Inertol | Hand | Std. of N. J. Brick Filler | Cheesecloth | 3.0 | 440 | .041 |
| W | Wailes, Dove-Hermiston Corp. | Brush | Bitumastic Sol. | Sling | Bitumastic Special | ——— | 3.5 | 456 | .058 |
| WF | Wailes, Dove-Hermiston Corp. | Brush | Bitumastic Sol. | Machine | Bitumastic | 15 lb. asbestos | 6.7 | 425 | .154 |
| WL | Lead Industries Assn. | Brush | Red Lead | Sling | Bitumastic | ——— | 3.2 | 450 | .052 |
| WR | Wailes, Dove-Hermiston Corp. | Brush | Bitumastic Sol. | Sling | Bitumastic | ——— | 3.5 | 420 | .0305 |
| WW | Wailes, Dove-Hermiston Corp. | Brush | Bitumastic Sol. | Sling | Bitumastic | Wood veneer | 3.3 | 420 | .100 |
| X | Milwaukee Gas Light Co. | Brush | Pabco Primer | Pabco Mach. | Floatine | Pabco rag felt | 2.0 | 400 | .123 |
| Y | East Ohio Gas Co. | No Primer | —— | Hand | ——— | Cotton Sheeting | 1.7 | 372 | .115 |
| Z | Hill, Hubbell & Co. | Brush | Inhiburine | Machine | Biturine Spec. AX-I | *15 lb. asbestos | 6.3 | 430 | .119 |

*Final application of Kraft paper.

## IV. Burial of the Specimens

### 1. *General Method of Burial*

Table II gives the scheme of burial of the specimens. All of them have been buried except the ones in Los Angeles and Kansas City. As can be seen from Table II, 4 specimens of each coating are buried in each location. The specimens are laid crosswise in the bottom of the trench, with 9 inches between the centers of adjacent specimens. In each location the specimens are divided into 4 groups, each group containing one specimen of each coating. Each group was laid in a trench in the same order that the coatings are arranged in Table I. A bare specimen was buried at each end of each group. The specimens will be removed at 4 separate times, one group being removed from each location at a time. It is planned to remove the first groups next September.

### 2. *Descriptions of Soils and Burial Places*

a. *Cinders.* Some distribution men feel that cinders are the cause of all of the corrosion of their mains, and almost everyone believes that cinders are a source of considerable trouble. The composition of cinders probably varies over a wide range and their corrosiveness probably also varies widely. The sharp angular fragments will probably press holes in the softer coatings. The location at Pittsburgh is in an old bed of cinders that is high and well drained. At Milwaukee the trench is near a canal, in which the level of the water is usually at about the level of the specimens. In this place the cinders are fresh.

b. *Tidal Marsh.* About 2500 square miles of Tidal Marsh have been mapped along the Atlantic and Gulf coasts. As the name implies, the surface of the marshes is practically flat and is covered with ocean water at high tide. The soil material varies from dark, oozy sediments interspersed with coarse marsh grass roots to a yellowish or dark colored clay which rests at 2-4 feet upon still darker colored clay. The subsoil and free water of the soil are charged with hydrogen sulphide. The vegetation consists mostly of salt grass. Most of the dipped coatings which were removed from Tidal Marsh by the Bureau of Standards in 1926 after a burial of about 2 years were in a rather bad condition. The original Bureau burial place in Tidal Marsh is near an oil refinery and much of the waste from the refinery flows in a near-by tidal stream. For this reason this location may not be typical of average conditions in this soil and so new locations were chosen at Atlantic City and Brockton, Mass.

c. *Muck.* Areas of muck are found distributed over the entire United States, especially along sluggish streams and in low, swampy places where the remains of growing plants have been partially preserved under water. These areas are small and widely scattered. Areas of peat or muck or both have been mapped in 28 states. Muck is a soil containing between 25 and 65 per cent of organic matter. The bare and coated pipes that have been removed by the Bureau of Standards from muck in New Orleans show that it is a very destructive soil. The New Orleans soil contains considerable filled material and is not typical of average conditions in this type, so new locations were chosen in West Palm Beach and Miami. These cities are adjacent to the Everglades, which is the largest body of organic soil types in the United States.

d. *Cecil Series.* These soils are most prevalent in the southern Piedmont, where they are the most important soils. This series occupies about one-third of the entire Piedmont plateau, having an area of about 25,000 square miles. The soils of the Cecil series have grayish brown surface soils in the sandy types to reddish brown and even red surface soils in the heavier types, and a red, stiff but brittle clay subsoil. The parent rock, which is of igneous origin, is predominantly granite or gneiss, is found at depths ranging from 3 to perhaps as great as 30 feet. Rock fragments are often found in the soil. Quartz sand is nearly always present in the subsoil and is often on the surface, especially in the sandy types. This soil is not as destructive to pipe or coatings as either muck or tidal marsh but

it ranks eighth among the 47 burial locations in pitting rate. One set of specimens is buried at the original Bureau of Standards location at Atlanta and the other set is in a new location at Raleigh. This soil was chosen because it has a large area and it is one of the best examples of an old well-weathered soil.

e. *Susquehanna Clay.* The soils of the Susquehanna series are developed most extensively in the higher portions of the coastal plain from the vicinity of Chesapeake Bay to Central Texas. The area of this series is approximately 12,000 square miles in the states of Maryland, Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Oklahoma and Arkansas. The fine sandy loam and the clay are the principal types. These are grayish (in the sandy types) to red (in the clay), with stiff, plastic, red heavy clay subsoils, which become mottled in the lower part with gray or bluish gray, red and yellow. Often the mottling begins just beneath the soil. This layer extends to from 60 to 72 inches; the mottling is usually red in the upper and light gray in the lower part. Below this is the parent material which consists of alternating layers of light gray or bluish gray clay and brownish yellow fine sandy material. The surface of these stiff lands is characteristically rolling to hilly but the topography is usually more subdued west of the Mississippi. One set of specimens is buried in this soil at Shreveport, La., near some bare specimens that were buried by the Bureau of Standards in 1928.

f. *Miller Clay.* The soils of this series are typically developed in the first overflow bottoms of streams, usually from the Permian red bed region. They are found along the Brazos and Red Rivers in Texas and Louisiana. Considerable areas are but rarely overflowed. Approximately 2,500 square miles of Miller soils have been mapped in the states of Arkansas, Louisiana, Texas and Oklahoma. The Miller series includes soils of chocolate brown to pinkish red color, with chocolate red or pinkish red subsoils. One set of specimens is buried on the first terrace of the Red River near Shreveport and one set near the Little Brazos River about 10 miles west of Bryan, Texas.

Specimens were buried in the Susquehanna and Miller soils because they are very heavy soils and they shrink a large amount upon drying out. The effect of soil stress on the coatings should be a maximum in these soils if soil stress is due to the shrinkage and swelling of the soil.

g. *Alkali Soils.* Two sets of specimens will be buried in the vicinity of Los Angeles in two locations, in one of which the soil alkali is principally sulphates and in the other the soil alkali is unusually high in carbonates. These specimens will be buried in about two months.

h. An incomplete set of specimens will be buried soon in Marshall silt loam in the vicinity of Kansas City. This soil is perhaps the most extensive soil in the United States. This is a dark colored prairie soil derived directly from the weathering of the loess mantle which was distributed over the central part of the Mississippi drainage system by the wind. This soil is not particularly corrosive nor is it likely to prove very destructive to coatings. However, it was thought that it would be advisable to bury one set of specimens where conditions are about average.

## V. Laboratory Tests of the Coatings

### 1. *Work of the A. G. A. Research Associate*

Numerous laboratory tests of both coating materials and of coatings have been made in the past and many are being made at the present time. These tests are valuable if for no other reason than that they show what the properties of the various coatings are. However, investigators interpret many of these tests in different ways, in fact one of the reasons why there is such a wide variety of coatings for pipe lines is because individuals have different ideas as to what a successful coating should be. Hence it is evident that in this investigation we should learn all we possibly can as to the laboratory behavior of the coatings in the test so that when we obtain the results from the buried specimens we may be able to define the properties of the best coatings.

A panoramic photograph of the surface of one specimen of each coating has been made so that there is a permanent record of the original appearance of each coating. Before the specimens were photographed a thin layer of wet clay was placed on part of the specimens, allowed to dry, and then washed off. When the specimens are removed it should be possible to tell whether the above test has any value.

A few specimens are being subjected to the accelerated weathering test for bituminous materials. This testing machine is described by Walker and Hickson in the Bureau of Standards Journal of Research Vol. 1, No. 1, p. 1, July, 1928. About all that can be said from the results so far obtained is that the materials would be classed as high-grade materials from the standpoint of accelerated weathering.

It is anticipated that before the specimens are removed next fall all the important physical characteristics of the coating materials will be determined.

An attempt is being made to develop a satisfactory method of rating the specimens when they are removed. At this time it is impossible to say how successful this will be but the few results obtained so far look promising.

### 2. *Work of the Bureau of Standards*

As a part of its contribution to this investigation, the Bureau of Standards agreed to try to develop some method of testing coatings so that at any future time it will be possible to tell something about the value of any protective coating by some short laboratory test. The first thing to do in trying to develop such a test appears to be to try some of the methods of test that are now being used and see how the results of the test compare with the performance of the coated specimens that have been buried.

One method that has been proposed (F. W. Karl, A.I.M.M.E. Proc. 1927, p. 528) consists of placing the coated pipe in an electrolyte, taking care to protect the ends, and measuring the resistance of the coating from time to time. A specimen of each of the coatings in the test was sawed into two equal parts. One of these parts was placed in a one-gallon crock, the end with the can on being downward. The crock was filled with a 10 per cent sodium chloride solution and the resistance was measured between the pipe and a carbon electrode placed in the salt solution. The method of measur-

TABLE II

Burial Scheme of American Gas Association Pipe Coatings

| *Specimen Numbers* | *Soil* | *City* | *Cooperating Utility* |
|---|---|---|---|
| 1-4 | Cinders | Pittsburgh, Pa. | Equitable Gas Co. |
| 5-8 | Cinders | Milwaukee, Wis. | Milwaukee Gas Light Co. |
| 9-12 | Tidal marsh | Marshfield, Mass. | Brockton Gas Light Co. |
| 13-16 | Tidal marsh | Atlantic City, N. J. | Atlantic City Gas Co. |
| 17-20 | Muck | West Palm Beach, Fla. | Florida Public Utilities Co. |
| 21-24 | Muck | Miami, Fla. | Florida Power & Light Co. |
| 25-28 | Cecil clay loam | Atlanta, Ga. | Atlanta Gas Light Co. |
| 29-32 | Cecil fine sandy loam | Raleigh, N. C. | Raleigh Gas Co. |
| 33-36 | Susquehanna clay | Shreveport, La. | Southern Cities Distributing Co. |
| 37-40 | Miller clay | Shreveport, La. | Southern Cities Distributing Co. |
| 41-44 | Miller clay | Bryan, Texas | Community Natural Gas Co. |
| 45-48 | Alkali soil, largely sulphates | Los Angeles, Calif. | Los Angeles Gas & Electric Corp. |
| 49-52 | Alkali soil, largely carbonates | Los Angeles, Calif. | Los Angeles Gas & Electric Corp. |
| 53-55 | Marshall silt loam | Kansas City, Mo. | Kansas City Gas Co. |
| 56-60 | Bureau of Standards for laboratory tests. | | |

ing the resistance was essentially the same as the method used to measure soil resistance with the earth-current meter, but the voltage was only one volt and more sensitive instruments were used to measure the current. A layer of paraffin was poured over the water to prevent evaporation. The test is still in progress, the resistance of each coating being measured every week. Twelve of the 41 specimens developed leaks in the cans and these tests are to be repeated. At the end of seven weeks fourteen of the remaining coatings had a resistance so high it could not be measured with any precision. The resistance of the others decreased with the time, except in two cases where it dropped to a low value and then increased a little. The initial resistances of the different coatings varied from about 3 ohms to at least several megohms, and after seven weeks the resistances extend over about the same range. If the value of a coating depends upon its electrical resistance, some of the coatings must be certainly worthless. If a rapid rate of change of resistance indicates failure, then other coatings are of no value. The coatings do not break down at a definite time, but the resistance gradually decreases. It is difficult to interpret the results of this test at the present time.

The Bureau has also started another set of tests similar to that described by K. H. Logan in the *Oil and Gas Journal* of May 2, 1929, Page 33. In this test the coatings are exposed to a heavy clay soil and the resistance of the coating is being measured by a method similar to that used in the salt solution tests. This test has just been started and it will probably extend over a period of several months. The boxes will be wet only at long intervals so that the effect of the drying and shrinking of the soil can be observed.

SUMMARY

In order to obtain information as to the value of the important kinds of proprietary coatings that are used by the gas industry, the Subcommittee on Pipe Coatings and Corrosion of the Distribution Committee of the American Gas Association appointed a Research Associate at the Bureau of Standards last April. Sixty specimens of each of 42 coatings have been prepared and most of them have been buried. The laboratory work associated with the tests is well under way. It is planned to remove one fourth of these specimens for examination and study next September.

## Standard Oil Subsidiary

ANNOUNCEMENT has been made of the formation of Standard Management and Operating Corporation, a subsidiary of Standard Oil Company of California, with offices at 225 Bush Street, San Francisco.

The officers and directors are as follows: E. F. English, president; R. W. Hanna, vice-president; E. A. Olsen, vice-president; R. N. Dreiman, secretary and J. H. Tuttle, treasurer.

# Six Southern Properties Change Over to Natural Gas

SIX of the properties of the Southern Cities Public Service Company in the southeast now are using natural gas in place of manufactured gas, following the recent completion of pipe lines from the natural gas fields of Northern Louisiana into the territory served by that division of the Central Public Service Corporation.

Rome and Atlanta, Georgia, most distant from the fields, are over 400 miles away. Other, nearer properties which have converted their systems to use natural gas are Anniston, Gadsden and Tuscaloosa, Alabama, and Columbus, Mississippi. Marietta, Georgia, a thriving city suburban to Atlanta and twenty miles distant, which previously had no gas service, now is being operated by the Atlanta Gas Light Company.

Consideration is being given to extension of the lines to serve other Southern Cities properties, notably Montgomery, Alabama, and Macon, Georgia, and a number of smaller communities along the pipe line itself are being served directly by the pipe line company.

Many engineering problems, aside from that of laying the pipe line itself, have been involved in adapting the mains systems of the various cities, all of which had been designed for manufactured gas, to distribute the new fuel. In the case of Atlanta, it was necessary to construct over seventeen miles of twenty-inch belt line as a feeder main, which will eventually encircle the city. In smaller cities the problem was met by the construction of high-pressure feeder mains of smaller proportions.

Much reconstruction was necessary in the replacement of lead joints with rubber and cement to hold the dry natural gas—problems doubtless familiar to all gas engineers.

In all of the cities in the Southern Cities Public Service Company group the task of the readjustment of domestic gas-burning equipment was assumed by the companies, no charge being made to the customers for ordinary household gas equipment. Technical and industrial equipment was converted, and charges made to cover the labor and parts involved.

In the smaller cities natural gas was turned into the mains serving the entire city at one time, and a conversion crew, working from house-to-house, proceeded with the conversion immediately. In Atlanta, the city was divided into twelve districts, each district being turned on as rapidly as the conversion was completed in the preceding district.

A series of advertisements, informing customers of the progress of the work, of the changes which would be necessary, and of the altered scale of rates which would apply, were printed in all newspapers for a period before the conversion actually took place. Several days before gas was turned into any district, large red cards, giving the date of the turn on, and full instructions to customers as to the use of their apparatus after the turn on and before conversion of their appliances, was mailed to each customer. As a result of these precautions little confusion and inconvenience resulted.

Provision for greatly increased gas usage was provided for in the conversion plans in all the cities affected; in the case of Atlanta this amounted to approximately ten times the present capacity of the system in volume. This is apparently being justified by the rapidity with which increased domestic and industrial installations are being made. During the first week, house heating installations were being ordered at the rate of thirty a week, and the industrial load contracted for had equalled the entire previous yearly average output of manufactured gas.

## Favors Tulsa Exposition

THE United States House of Representatives Committee on Foreign Affairs, to which was referred House Joint Resolution 244, authorizing the President to invite the States of the Union and foreign countries to participate in the International Petroleum Exposition at Tulsa, Okla., to be held October 4 to 11, 1930, inclusive, recently reported it to the House with the recommendation that it pass.

The International Petroleum Exposition (Inc.) is a nonprofit organization formed for the purpose of promoting better trade relation.

## Industrial Gas Section

C. C. KRAUSSE, Chairman — C. W. BERGHORN, Secretary — D. W. CHAPMAN, Vice-Chairman

# Information on Malleableizing Cast Iron by the Short Cycle Process

IN a bulletin issued by the Competitive Fuels Committee to members of the Industrial Gas Section announcement is made that several plants, manufacturers of malleable cast iron* have adopted a so-called short cycle annealing process by means of which the annealing time is cut very considerably, in some cases from 90 hours to 25 hours. As far as data is available at the present time, this improvement has been accomplished by the introduction of electric furnaces under very accurate temperature control. However, there seems no valid reason why gas could not be equally well applied for this work. The data given herein is intended to supply some basic information on the subject, by means of which it may be possible to operate gas furnaces on the same basis.

Malleableizing† of cast iron is the process whereby the physical properties of cast iron are improved, in particular reference to increasing the malleability (making the cast iron less brittle) by means of suitable heat treating. To aid in the understanding of what takes place in malleableizing of cast iron, reference may be made to Bulletin 296 of the Bureau of Mines, "Iron Oxide Reduction Equilibria," in which, beginning with page 199, there is an extensive technical section devoted to the iron-carbon system.

All iron-carbon alloys on cooling at the usual air cooling rates result in mixtures of nearly pure iron (called by the metallurgists "ferrite") and the chemical compound iron carbide (called "cementite"). The study of iron at various temperatures, and after various treatments, reveals a great many forms and combinations. Cast iron is arbitrarily iron between the limits of 2.2 up to 6 per cent or so of carbon. The cast irons are further divided into several classes, one of which, white cast iron, is so called because of the fact that it has been chilled quickly from the molten state so that practically all of its carbon is present as the compound cementite (there may be other elements present in white cast iron).

The making of white cast iron into malleableized cast iron is accomplished by causing the cementite to decompose, liberating particles of finely divided free carbon. The quality of the malleableized casting depends upon the thorough dissemination of these small particles, and the fineness of the carbon particles. These small particles are termed temper carbon, and the process is known as graphitizing.

The source of the temper carbon has a bearing on the quality of the finished casting. Apparently it would be liberated at different rates from the austenite‡ and the cementite which make up the untreated casting. In order to secure the desired fineness and dissemination, the casting is first heat treated in a high temperature furnace to make the particles of cementite disappear in the austenite. This is termed the solid solution of the cementite in austenite. When this process is finished, the temperature of the casting is reduced in a low temperature furnace to that level at which graphitizing takes place.

The process of malleableizing cast iron divides itself into two distinct parts: first, the solution of the cementite in austenite, which is a function of time and temperature. Investigations show that the speeds of solution are about as follows:

At 2000° solution was effected in 15 min.
At 1922° solution was effected in 2 hrs.
At 1832° solution was effected in 3 hrs.
At 1742° solution was effected in 10 hrs.
At 1652° solution was effected in 30 hrs.

The above data shows that the speed of disappearance of cementite in austenite (solid solution) increases as the temperature is raised, but since the higher temperatures increase warpage and distortion of the casting, the operator will be limited to maintaining the highest possible temperature which will leave the castings unchanged.

So much for the solid solution of the cementite. The graphitizing can now be considered. It will be found that the more rapid the original cooling rate of the casting (when it was cast from the molten iron), the more easily will the graphitizing take place. The graphitizing is also a function of time and temperature, with the following data available:

The maximum rate of precipitating temper carbon occurs between 1380° and 1290°. Therefore, the low heat furnace is kept between these levels (as the temperature is reduced from the high heat furnace, precipitation of temper carbon will be found to begin below 1625°, increasing to the maximum and then tapering off until precipitation ceases at temperatures around 1200°). Graphitizing should be done in the temperature range 1380° to 1290° in slowly descending steps in order to accomplish it in the shortest time.

The experience of the General Electric Company indicates that the hard white iron castings, either cleaned or uncleaned, should be put into the high heat furnace and brought up to the highest temperature to effect solid solution as quickly as possible. As soon as this process is completed, the casting should be put into the low heat furnace, starting the cooling operation (graphitizing) at a temperature around 1364° and bringing it down 18° each 4 hours, until a temperature around 1328° has been reached and maintained for 4 hours. Then the castings are removed to a cooling furnace or to the air. Reaching the low temperature 1300° to 1328°, it is possible to quench directly without serious embrittlement.

The report of work done at one plant in electric furnaces showed that the short cycle anneal gave better properties than the A.S.T.M. standard for malleable cast iron. The tensile strength was reported as 56,000 lbs. per sq.in., yield point 34,000 lbs., elongation of a 2 in. piece 15 per cent. One of the big advantages which was secured in one electric installation was that the process produced very little skin, reducing the cleaning practically to nothing. Whether or not this is due to the short cycle anneal or to the use of an electric furnace with its close atmospheric control is not certain at this time. Presumably both had something to do with it. In any event, the claims made for short cycle annealing include the elimination of boxes, reduction of the cleaning, and shortening of the time required for the work.

The process is critical and involves accurate temperature control instruments in order that the graphitizing may be carried on under the best possible operating conditions. As far as is known, no attempt has been made to use this annealing procedure with gas-fired furnaces, the entire work having been developed by the General Electric Company for electric furnace operation.

* The term malleable cast iron is primarily confined to iron with 2.5 to 3 per cent carbon and 0.5 per cent silicon, made from refined hematite ore pig. European and American cast iron are different, the former being termed white heart and the latter black heart malleable cast iron, in reference to the color of the metal when fractured.

† Sometimes the treatment of white cast iron is called annealing malleable cast iron. As will be seen from this service letter, the term is somewhat a misnomer. The proper phrase is malleableizing white cast iron.

‡ Austenite is the name given to an iron-carbon solution existent at temperatures above 1350°.

## Commercial Section

G. E. WHITWELL, Chairman J. W. WEST, Jr., Secretary E. R. ACKER, Vice-Chairman

# The Accountant's Contribution to Merchandising*

By H. C. DAVIDSON
Secretary, Consolidated Gas Company of New York

*H. C. Davidson*

IT is with some trepidation that I appear again before a gathering of gas and electric men to discuss the subject of merchandise accounting, in view of the number of previous occasions upon which I have championed its cause at the meetings of the State and National Associations. It is at the risk of being classed among the "hardy perennials" on that subject, that I have responded to the request of your Chairman, to discuss it further today.

The progress during the past year, both in the general recognition of the fundamental principles of appliance sales and other promotional activities and in the development of a classification for these accounts, is worthy, I believe of presentation before this meeting. I am glad of this opportunity to submit to you briefly the developments to date in those matters. The phase of the subject, however, to which I shall address my remarks primarily today, concerns the contribution it is within the power of the accounting fraternity to make, toward the ultimate solution of this problem through the sound presentation of the financial and statistical results of these departmental activities.

When I refer to the contribution the *accountant* can make upon this subject, I am using the term in its broadest sense. I am thinking really in terms of the accounting officer, whose duties and activities deal with all the ramifications of accounting service.

### *Need of Sound Thinking on this Subject*

The subject of merchandise policies has been very much before the attention of the utilities during the past two or three years, and in that period, I believe much progress has been made toward sound thinking upon the subject. Criticisms from the outside (which were based principally on misunderstanding or on isolated cases not representative of general practices in the industry) found the utilities unprepared to deal with the matter effectively. There was no crystalized consensus of opinion which was representative in the industry either as to merchandising objectives or methods.

We have faced the problem of education, therefore, in respect of merchandising policies, both within and outside of the industry. The Legislative action in Wisconsin requiring the divorcing of merchandising activities from utility operations, is evidence that this task of education has not been completed.

A clear understanding of the sound economics of this question was never more needed than today, nor was there ever greater necessity of unanimity of opinion and solid support, on the part of the industry, in presenting to the public the true picture of the relationship of appliance sales to new business operations.

### *Relationship of Merchandising to Utility Operations*

Before we can get far as to the scope of the possible service which the accountant can render upon this subject, we must reach some common ground as to the real economics of merchandising operations, which we seek to make the public understand.

What are the merchandising operations to be recorded? Are they an integral part of the gas or electric business, or are they something unrelated to utility operations, to be considered as an independent activity?

When I first gave serious study to this subject, I was impressed with the apparent opinion on the part of some executives, that merchandising practices were a matter of company policy, of no concern to others, as to which each company should be at liberty to follow the dictates of its own judgment. Frankly, at that time I despaired of the industry ever reaching a common ground, which would recognize the true relationship of merchandising operations to the gas and electric business. Some companies apparently were endeavoring to conduct a successful merchandise business as such, as if the sale of any appliance would satisfy the promotional needs of the utility operations. To me, from the very start, however, it seemed impossible to focus sales efforts successfully both upon profitable merchandising results and upon load building at the same time. The two lead to the sale of different classes of merchandise. Those most valuable for promotional purposes would never be carried or sold, if profitable merchandising were the sole objective. Yet they do not differ inherently from appliances enjoying general acceptance. The difference is purely one of degree, and there is no sharp line of demarcation between the two classes. The more I have studied this subject, the stronger is my conviction that all appliance sales are permeated with promotional interest; and that in the last analysis the promotional value far outweighs any possible merchandising profit.

Eliminating all questions of corporate organization or accounting practice, it is safe to say, I believe, that all companies are actually carrying out a promotional program in their appliance sales, and the apparent differences in policy are in reality nothing other than differences in classifying those efforts in two groups or in one. In fact, there may be certain operating advantages by segregating the appliance sales which should be self-supporting, to insure that they do pay their way, but before we can get the true picture of the promotional results as a whole, the two groups must be brought together.

In terms of the breakfast table, it is analogous to preferring your cream and your milk separately, or together as whole milk. In either case the nutriment is the same, although differently administered.

I have yet to find the company in which the division between merchandising and new business is not an artificial one that may be correctly characterized as purely bookkeeping. In the language of Amos and Andy, it is literally a case of "debit here and credit there" between the two, and it is the accountant that is really the source of profit or loss as to merchandising operations. He can "make or break" the merchandise statement of any company by the way he classifies indirect expenses.

We may consider the point established, I believe, that the real merchandising efforts of all utilities are directed to gas and electric service, and that the entire appliance operations are merely promotional accessories of that service.

### *Place of the Accountant in this Problem*

Now what is the place of the accountant in the solution of this problem?

The early idea of the accountant's job consisted of recording history. He did not appear on the scene until all questions of policy had been determined, and he labored only with matters of the past. If that definition of the account-

*Remarks before the Accounting Section Annual Meeting of the Empire State Gas and Electric Association at Briarcliff, N. Y., April 24 and 25, 1930.

ant's place still applies, and he should only be concerned with the mechanics of a system of accounts for merchandise sales, we are not yet ready for him on this job. Since my connection with the merchandising accounting committees of the State and National Associations, I have heard the accountant relegated to that general position more than once, by expressions of opinion, something like this:

> "The merchandising problem is essentially one of executive policy. When that is determined, any able accountant could set up in a few hours a classification of accounts which would meet all needs."

Needless to say, I do not subscribe to that theory. Under present conditions with the apparent divergence of opinion on the part of the executives of the industry as to merchandising policies, it would place the accountant in a position similar to the boy who was not allowed to go into the water until he knew how to swim.

The modern conception, however, of the accountant's place in industry is as a research specialist on the financial and statistical aspects of the business. He must have initiative, and be working in futures as well as the past, determining the significance of trends and anticipating executive needs. In a sense he must be independent of management, free to reach his own conclusions, even though they may be at variance from established policies of his company. The accountant who goes that far in the study of the problems before him, will find it very difficult not to flavor his results with positive reactions of his own. He will inevitably find himself reaching conclusions and trying to sell them to his associates. In short, he will be determining policies, for he simply cannot help it.

You may ask what this has to do with the subject of merchandising under discussion. In reply may I remind you that it is the controversial questions, as to which the best minds may differ fundamentally, that offer the great opportunities for the accountant to rise to the higher levels of service. Answering more specifically, the merchandising activities of the utilities offer just such an opportunity for the accountant. If we are to evolve an industry-wide acceptance of the promotional character of merchandising, and to have the public understand and accept that principle as governing the appliance sales of the utilities, the accountant must provide in large part the data to prove the case. It is primarily his responsibility, through his organized accounting reports, to draw that difficult line between promotion expenses and merchandising costs so clearly and intelligently that the soundness and the good faith of his accounting practices can be convincingly established. To do that he must first have a keen understanding himself of the economics of the question, and then he has an educational job of large proportions, both within and beyond the confines of the industry.

*Classification of Accounts for Merchandising Operations*

The need is generally recognized of a supplementary classification for merchandising accounts, in amplification of the present provisions of the National Classification. Much study has been given to this subject both by the gas and the electric industries, to provide a set of accounts which will serve the purposes of management, and will also permit of comparable operating statements by the various companies, and the compilation of national totals.

Both the N. E. L. A. and the A. G. A. have Committees engaged in the development of this classification, and are approaching the culmination of their efforts, in the joint endeavor of the two Committees to adopt identical merchandising classification for both industries. In fact, I believe the attainment of that goal is already assured.

We will soon have, therefore, a classification which we hope will merit the support of both industries. At least it will represent the product of the best minds we have been able to interest in the study of this subject.

Owing to the wide difference in company practices in the conduct of their appliance sales, and to the differences in company charters, State laws, and other external conditions, the classification necessarily must be elastic in its provisions, to be adaptable to all companies. Some companies may be able to adopt it as a further subdivision of the prescribed classification. Others may use it only statistically. To my mind, it is not so important which course is followed, for in either case the elements involved and the detailed accounts required are the same.

The Committee is doing another thing of importance to the policy aspects of this question. It proposes to submit, in connection with the merchandising classification, a form of statement for the summary of new business operations, which will set forth the net result of the total expenditures, divided between merchandising activities and other promotion expenses not directly related to the sale of appliances. I commend that particularly to your careful consideration, for it definitely reflects the inter-relationship of the two groups of new business activities. Such a statement will set forth graphically the division made between merchandising and other new business expenses, of items common to both, such as supervision, advertising, rents, and the like. It needs, therefore, that independent attitude of the accountant, to which I have referred, to insure that it is sound, and that the propriety of the division will be beyond question. To accomplish that may impose upon the accountant the burden of setting up and proving his own theory of the proper allocation of the various items of expense.

A further interesting study undertaken by the Committee, in the development of comprehensive accounting records, deals with the evaluation of promotional expenditures in terms of load building results. It is recognized that ordinarily such figures can only be approximate, for anticipated future consumption cannot be estimated with exactness. Nevertheless the desirability is obvious of the best information obtainable as to the promotional benefit of appliances sold. Furthermore, with the development of the more comprehensive analysis of gas or electric sales, which is a by-product of the tabulating card system of consumers accounting, it will be possible to determine more directly the effect of appliance sales on consumption. It does not require undue imagination to visualize the value of load building statistics by classes of business, as a guide to management, both for sound rate structures and in seeking new business.

The merchandising classification and the related statements, however, represent but the first step in the accomplishment of adequate data on this question. They are analogous to the doctor's prescription. There remains the question of administering them. The real value of the classification must come from its general acceptance and use, and the stimulus to uniformity of accounting practices which will result.

In that task lies the opportunity for the accountant to make his contribution to the successful solution of the problem. He stands in a favorable position, with a certain independence of viewpoint, in his relationship to the Sales Department and to the operating executive, to influence the policies of his company in this matter. He is the source of the figures, and is in a position of advantage to analyze and digest them in the making, and to classify them according to his own ideas. In fact, the stage is set, I believe, for his active participation in a position of leadership in the formulation of industry-wide accepted accounting policies as to merchandising operations.

You may feel that I have over-emphasized the place of the accountant in this matter. Possibly so. But gentlemen, I feel that his success in fulfilling that role depends primarily upon two factors, for which he is responsible—his initiative and his ability.

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## Summer Course at M. I. T.

Announcement recently was made by the Department of Chemical Engineering of the Massachusetts Institute of Technology that a special course in Petroleum Refining will be offered during the summer sessions, July 7-August 9. Registration for the work will be limited to men with adequate training along engineering and chemical lines, who also have had industrial experience relative to the course. Problems analagous to those encountered in the production of benzol in the by-product coke industry will be studied.

## Accounting Section

J. L. CONOVER, Chairman — H. W. HARTMAN, Secretary — J. I. BLANCHFIELD, Vice-Chairman

# Classification of Sales*

*T. V. Purcell*

By T. V. PURCELL

The Peoples Gas Light & Coke Co., Chicago, Ill.

IN the early days of the gas industry, when our business was exclusively lighting, our customers were all of one class, the so-called "domestic class." Their needs were almost identical and their habits with respect to the use of gas were similar. The use of gas was affected by the same conditions of long or short days, cloudy or sunny skies, and this resulted in practically an identical load factor for every customer. Nor was there a very wide range in the volume used.

Under these conditions, the flat rate generally charged was satisfactory and was a fair way of assessing on individual customers the total costs of operating the business.

Later on, with the advent of cooking and the loss of lighting, this situation was not materially changed. The cooking customers were the same as those whom we had supplied for lighting, and they all had about the same habits with respect to the use of gas for cooking.

So here again we had a large group of customers whose individual load characteristics and demand were practically the same.

Of course, it would have been very interesting if we had been able to separate lighting from cooking. We would then have been able to note the trend downward in lighting and the trend upward in cooking. We were able to get along without this because the cooking came on faster than we lost the lighting business, the net result being a steady increase in total sales year after year. Had the situation been reversed and we had lost the lighting load faster than we secured the cooking load, it would have been most helpful if the curves of each class could have been plotted so that we would be informed promptly of the trend to enable us to take the necessary steps to safeguard our investment.

If we trace the history of our industry a little further, we come to the time when the lighting load was practically negligible, and our business had become almost 100 per cent cooking. With important changes in the habits of the people, this cooking load was more or less threatened, and we were forced to find other avenues of sales.

We began to take on hotel and restaurant, water heating, industrial, and house heating business. These new classes were taken on so gradually that in the beginning it was hardly thought necessary to attempt to make any classification, but as these classes grew in volume and in proportion to the whole, it became very evident that we must have some way of segregating them, both as to volume and as to costs.

Even a superficial investigation shows that these classes are very different in those characteristics affecting the cost of service. It is apparent, therefore, that there is a need for statistics to show all the significant features of the various classes of business. This is the primary purpose of a current classification of sales, the justification of which may be summarized under three heads.

1. It is an essential in the analysis of the cost of service preliminary to the construction of equitable and competitive rates.
2. It is necessary for the intelligent direction of sales effort.
3. It is required as a base for the preparation of a budget.

Let us now analyze the first objective which is the acquiring of data for rate making.

It goes almost without saying that the cost of service differs with varying load characteristics. Load characteristics are those factors inherent in a specific use of gas that determine the cost of supplying the gas. Among these factors are volume, maximum hourly demand, maximum daily demand, time of demands, etc. It is obvious that volume is an important element of cost, but there are other elements that are independent of the volume delivered. These cost elements are commonly grouped by the rate maker under four main headings.

*First—Production Demand Costs*

These costs are determined by the volume of gas that will be required by all customers on the system's maximum day. Since hourly fluctuations in demand are cared for by the use of storage holders, the daily maximum demand of the system determines the production investment required.

*Second—Distribution Demand Costs*

The size of the gas company's distribution system is dependent largely upon the hourly maximum demand.

It may be here noted that volume delivered has no bearing on the above costs since the charges accruing thereto exist even though no gas may be used by an individual customer.

*Third—Commodity Costs*

This division of expense includes only the cost of the raw materials going into the product and the necessary production labor, etc. These costs are dependent upon and vary directly with the volume of gas produced.

*Fourth—Customer Costs*

These include all expenses incurred in reading meters, billings, collecting, etc., and are practically the same for each customer, and are independent of the volume of gas used.

It is apparent then that the costs imposed on the gas company by any individual customer are dependent upon the demand he makes on the facilities of the company, the time of the day or year that he makes this demand, and the volume of gas he uses; that is to say, costs depend upon load characteristics.

Of course it would not be practicable to consider the load characteristics of each customer and construct a rate for him individually. However, it is not only practical but necessary to consider the characteristics of groups or classes of customers if we are to construct rates that will be fair as between groups and that will be competitive with other fuels.

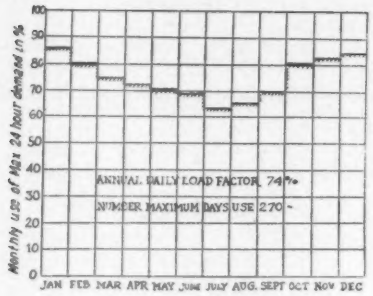
The more important groups of customers are the domestic, hotel and restaurant, commercial, industrial, and house heating.

It would take too long and would be somewhat outside the scope of this paper to discuss the peculiar features of the use of gas by each of these groups and to trace their effect on the cost of service; but it might be well to consider for a moment two curves, one representing the annual daily load factor of the domestic load and the other of the house heating load.

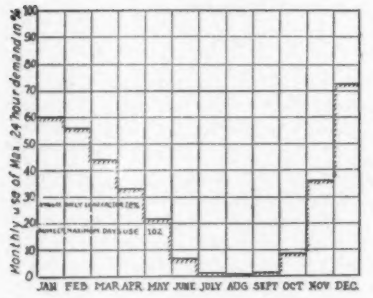
The whole of each rectangle may be taken to represent the capital required for the necessary production equipment to supply the maximum day of 100. The shaded portion below the line represents the annual daily load factor, or the amount of capital usefully employed. The unshaded portion above the curve shows the idle investment in production equipment.

* Presented at the Accounting Section Conference held at Hotel Stevens, Chicago, Ill., April 3 and 4.

DOMESTIC


Monthly use of Max 24 hour demand in %
ANNUAL DAILY LOAD FACTOR, 74%
NUMBER MAXIMUM DAYS USE 270
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC

HOUSE HEATING




A comparison of these two curves brings out the fact that for the domestic load the production capacity is in useful operation 74 per cent of the time whereas for house heating it is in useful operation only 28 per cent of the time. This difference must be reflected in the price of gas for each of the groups. House heating must carry a penalty in a demand charge two and a half times greater than that included in the price of domestic gas.

This penalty would make it impossible to sell gas for house heating if it were not for other characteristics that affect the costs in the other direction and make it possible to sell gas for house heating at a lower price than for domestic use.

It follows then that it is absolutely essential that the rate maker be provided with a classification of sales so that he may evaluate the characteristics of each class of business in order to construct equitable and competitive rates.

Coming now to the second reason for classification of sales—that of effective sales direction. Sales executives today recognize the necessity of market analysis, but when a sales manager of a gas company undertakes to make such an analysis, he finds he has several distinct markets for his service instead of one. He finds that his customers, present and prospective, group themselves into definite classes, differing widely in the type of service demanded. This suggests at once that we will require as many methods of approach in our advertising and in our salesmanship as we have separate classes.

In the domestic class, we are dealing with a cross-section of the whole community, but the individuals who are most concerned with the service are women, that is to say, the housekeepers. Our advertising appeal and the general sales plan must be adapted to this particular public. In fact, even in the selection of the salesmen, we must have well in mind the class of people we are dealing with. The salesmen must indulge in much doorbell ringing, or cold canvassing. They beat up the bush, closing sales where their experience and ability permit, and opening the way for men with better technical training where that is necessary. These men are recruited from many walks of life and require only a minimum of training to develop them into satisfactory representatives of the company in this field.

In the hotel and restaurant field, we deal with known prospects having known requirements. Our advertising must be highly specialized and the men selected for this work must have had some previous experience, either in the gas company or outside. In this class, the per meter sales are large and the load factor is very good. Sales effort, therefore, can be arranged on a very generous scale.

Selling industrial gas especially is in a class by itself. Here we have to deal with executives and technical men. We have to study the methods and processes of manufacture in order to adapt or develop suitable gas-fired equipment. Consequently, we must employ high-class engineer-salesmen who can speak the language of their clients and who are capable of promptly mastering the details of a variety of manufacturing operations. And again, the advertising must be highly specialized, and the whole selling plan keyed up to the importance of this branch of our business.

Originally house heating was classified under domestic. We soon found that for the purposes of sales promotion, it required special treatment. Our best house heating prospects are builders of new homes. Immediately the architect and the builder comes into the picture, and a real problem presents itself. How to sell the architect and the builder—a problem calling for a carefully planned sales and advertising effort. Here the sales engineer must know how to figure heat losses, radiation, etc., and be able to deal with difficult installation problems.

From these considerations, it would seem to be obvious that from the point of view of proper direction of sales effort, each of the classes referred to constitutes a separate and distinct business.

Hats and shoes are both wearable, but we have hat stores and shoe stores. Suppose a department store were to attempt to merge its different departments and run them all with the same kind of personnel and the same merchandising methods. Without classification, losses of one department would be covered by the profits of another. This very thing has happened in our own industry. In more than one large city, there has been a steady and fairly satisfactory increase in total sales. However, on analysis it was found that this increase was made up of increases due to new avenues of sales and increases in population, notwithstanding a per meter decrease in the domestic load. In other words, it was discovered that a very important part of our business had been attacked by a disease, the symptoms of which were not discernible in any available statistics.

We now come to the third purpose for making a classification of sales—that is to provide an effective base for the intelligent preparation of a budget.

If the use of gas in the homes and in industry is to grow, the management must carefully plan ahead. Superior sales effort, supported by proper rates, are essential factors in securing new business, but the up-to-date management also recognizes the necessity of budgeting all of its operations.

The real foundation of the operating budget is not an estimate of expected revenue but rather a carefully prepared estimate of the gas that will be sold in each of the several important classes. From this the estimate of revenue is built up.

It may be true that estimates of prospective gas sales have always been made but for lack of a better method, we were satisfied to simply apply a flat percentage of increase to last year's total sales.

The budget maker now develops his estimate of gas sales in a scientific way. He does not make the mistake of considering the business as a whole. He takes one class at a time and gives consideration to factors that affect sales.

For example, in the domestic class, he will consider such things as increase in population, trend of consumption per meter, weather and employment conditions. In the industrial class, he is concerned with influences of a very different character. Here the prices of competitive fuels and the general business conditions are the important factors.

Assuming then the usefulness of detailed sales information and that there is a real need for classifying gas sales into a reasonable number of divisions we will consider a few of the methods that might be employed.

In the 1927 report of the Committee on Statistics and Cost Accounting, J. L. Conover, Chairman of a subcommittee, treated the subject "Analysis and Classification of Gas Sales," wherein he describes in detail the mechanized analysis of the sales of a large company, giving as a practical example a classification with 86 divisions, grouped into 8 principal sections with their respective subtotals. This serves to point out that with some mechanical equipment, the analysis can be carried to great refinement. This, however, may not be the ordinary requirement. A classification into a limited number of divisions, showing the number of customers, total sales, and average monthly consumption per customer will reveal facts which can be used to great advantage for rate studies, for sales pro-

motion, for budgeting of sales, and other diversified statistical purposes.

A classification under five or six heads can be made part of the regular billing routine with little or no additional expense. No machinery is necessary. All that is required is to have a code number on the addressograph plate and to recapitulate under the code numbers. A modification of this is to print an extra coupon on the bills, which are cut off just before the bills are issued, then sorted and accumulated on adding machines. When there is only one meter for two classes of consumption, very satisfactory methods of dividing the consumption can be worked out.

However, except for very small companies, the use of tabulating machines, so that more detailed data may be obtained, is very desirable, and the cost will be more than justified by the benefits to be derived.

As a matter of fact, classifying sales is so important for a proper understanding of our business that it is difficult to see why any company should hesitate to spend whatever amount is necessary to accomplish this end.

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Interesting discussion followed the presentation of Mr. Purcell's paper. H. C. Hasbrouck, of the Associated Gas & Electric Systems, said:

"There is one thought on the subject that it seems to me might be worth while for us to consider. It happens that last week I attended a meeting of the Rate Fundamentals Committee of this Association and one of the things that all the members of that committee appeared to agree upon was that the time had come for a little bit of caution in emphasizing the cost of service as an important element in rate making. The cost of service undoubtedly is something to be considered but as we all know, the value of service is the thing we always have to give most thought to, and undoubtedly in the future this should be emphasized more than the cost of service. The danger in emphasizing cost too much is that regulatory bodies will come to have the feeling that rate making is merely a matter of mathematical formula and that if you once get your cost analysis worked out, the proper rates automatically follow. I think all of us know that that isn't economically sound.

"For that reason, I just wanted to leave that thought with you, that a little more consideration in the future to value of service and a little less emphasis, at least in presentations before rate-making bodies, on the cost of service, might be desirable."

J. E. Kane of the Consolidated Gas Electric Light and Power Company, Baltimore, said:

"There is very little to criticize in Mr. Purcell's paper; in fact, nothing to criticize, but much to commend. I was much interested in the remarks of Mr. Hasbrouck as to the value of service to be considered in conjunction with cost of service in the setting of rates.

"I had the privilege of serving on a committee where we worked out a formula to ascertain the cost of the various classes of service. We, as a committee, reported to the convention that we should be very careful in setting our rates. The value of the service and what traffic will bear should always be taken into consideration. We are in a competitive business—not a monopoly, as we were at one time. By going after industrial and house heating business, each and every day we are getting more and more into a competitive field. To get the business we must set our rates at a price lower than the other fellow, and at the same time yield to the industry a fair return on the value of the property.

"In 1915 our company put in an industrial rate. Later we put in secondary rates for domestic consumption, also commercial consumption. Modifications were made in the rates from time to time, and last Fall we put in a rate which further modified the secondary consumption and also established a tertiary rate for house heating.

"Each one of these steps has made the problem more difficult and more scientific. I think Mr. Purcell's paper is a challenge to accountants to be on their job to present to their management pertinent facts, as Mr. Purcell has brought out. We want facts so that the management, equipped with the facts, can take the necessary steps."

Howard H. Agee, rate engineer of the Public Service Electric & Gas Company, Newark, N. J., said:

"I think Mr. Purcell brought out very forcibly the need of analyzing our sales rather than treating the business as a whole. There is a tendency to consider aggregate revenue without taking into account the amount contributed by various classes of customers. I believe that based on the developments in the last few years, we are more than ever before going to make rates that will get the business. We are separating our customers into classes, such as domestic, commercial and industrial and further separating industrial into classes of business, such as ceramics, foundries and other classes. In order to make rates which will attract business and also improve our net revenues, we must know our costs and at the same time we must have a knowledge of how we are developing the business in our territory.

"In our territory we have twenty-four gas districts and for each of these districts we have a summary of sales by classes of business. Our New Business men are enabled to watch the development of each business and let us know how the rates are developing that business. We will have a certain amount of difficulty unless we do have a sales analysis which is subdivided, in determining the effect of new rates. We are making studies of new rates all the time, but they are for specific purposes.

"In order to arrive quickly at the effect on revenue, we also maintain sales analyses by steps of the rates, both gas and electric. This enables me for my own company, to quickly determine what effect any proposed rate will have on the present revenues, and then by consultation with the New Business men we are enabled to make a definite drive for new business."

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## A. G. A. Director

RAYMOND CROSS, president of the Ohio Fuel Gas Co., Columbus, Ohio, was elected a director of the American Gas Association by the Executive Board at a meeting held April 16, 1930, to fill the vacancy caused by the resignation of W. W. Freeman.

*Raymond Cross*

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## To Enlarge Gas Plant at Hunts Point

THE 1930 construction budget of The Consolidated Gas Company of New York and its affiliated gas and electric companies is the largest in the history of the company, and is thirty-four per cent in excess of the 1929 budget, according to an announcement made by George B. Cortelyou, president of the company.

The 1930 budget provides for an expenditure by the gas and electric companies in the Consolidated system of $139,761,342, of which $97,561,042 will be spent in 1930, since several of the approved construction projects will be started but not completed this year. The estimated expenditure in 1930 is nine per cent more than the actual gross expenditure in 1929.

A large item in the budget is that providing for an extensive enlargement to the gas manufacturing plant at Hunts Point in the Bronx. This will be in the nature of additional coke ovens. The 1930 budget also provides for certain preliminary expenditures in connection with the erection of a "water gas" plant at Hunts Point, which will be completed in 1931.

"At the Washington conferences called by President Hoover to consider business conditions, the public utilities pledged themselves to construction and building programs that would stimulate employment and yet be in strict keeping with the policy of economical and conservative expansion," said Mr. Cortelyou. "In making construction appropriations, the primary consideration of the company will be the improvement of the service rendered to customers and the public."

## Manufacturers Section

F. G. CURFMAN, Chairman — C. W. BERGHORN, Secretary — E. S. DICKEY, Vice-Chairman

# Big Exhibit Promised At 1930 Convention

THE Exhibition Committee has allotted space to date to over 200 manufacturers who will exhibit at the Twelfth Annual Convention of the American Gas Association, which will take place in the Auditorium at Atlantic City, October 13-17. Among those below are represented the leading manufacturers of all kinds of gas appliances, accessories, equipment, apparatus, and office devices.

This year we are happy to welcome a number of companies who are exhibiting with us for the first time. The interest evidenced promises the largest and most diversified exhibit ever held in the industry.

The list of exhibitors follows:

Abendroth Brothers....425
A-B Stove Co....608
Adams Bros. Mfg. Co., Inc....134
Addressograph Co....724; 800
Air Reduction Sales Co....834
Alpha-Lux Co., Inc....617
Aluminate Co., Inc....312
American Cast Iron Pipe Co....109
American Foundry & Furnace Co....823
American Gas Furnace Co. 144, 5; 218, 19
American Gas Journal....311
American Gas Products Corp....525, 6
American Heater Corp....247
American Meter Co...327, 8, 9; 403, 4, 5
Griffin & Co., John J.
Helme & McIlhenny
Maryland Meter Works
McDonald & Co., D.
Metric Metal Works
Tufts Meter Works, Nathaniel
American Radiator Co....525, 6
American Rolling Mill Co....245
American Stove Co....506, 7, 8, 9, 10
Clark & Co. Div., Geo. M.
Dangler Stove Co. Div.
Direct Action Stove Co. Div.
New Process Stove Co. Div.
Quick Meal Stove Co. Div.
Reliable Stove Co. Div.
Autogas Corp....149
Automatic Gas Steam Radiator Co...140
Bailey Meter Co....227
Barber-Greene Co....5
Bartlett Hayward Co....517
Bartlett & Snow Co., C. O....126
Bauer & Black....108
Beckwith Co....424
Bernitz Furnace Appliance Co....229
Bingham & Taylor Corp....200
B-Line Boiler Co....240, 41
Blodgett Co., G. S....607
Boone County Coal Corp....224
Bowser Service Corp....223
Bristol Co....807
Bryan Steam Corp....514
Bryant Heater & Mfg. Co....413, 14
Bullard-Davis, Inc....11
Burroughs Adding Machine Co. ....23, 24, 25; 29, 30, 31
Carrier-Lyle Corp....629, 713
Chambers Mfg. Co....624, 5
Chaplin-Fulton Mfg. Co....203, 4
Chicago Bridge & Iron Works....202
Claus Mfg. Co....527
Cleveland Gas Burner & Appliance Co. ....237
Cleveland Gas Meter Co....704
Cleveland Heater Co....411
Cleveland Trencher Co....324, 25
Clow & Sons, James B....314
Columbia Burner Co....142, 3
Columbus Heating & Ventilating Co....214, 15
Connelly Iron Sponge & Governor Co. ....201
Connersville Blower Co....604
Consumers Construction Co....10
Continental Stove Corp....243, 44
Coxhead Corp., R. C....824
Crane Co....728, 29; 804, 5
Cribben & Sexton Co....632, 3, 4, 5
Crown Stove Works....119
Cruse-Kemper Co....705
Cutler-Hammer, Inc....801, 2, 3
Dearborn Chemical Co....520
Detroit-Michigan Stove Co.
Garland Div....611, 12, 13
Jewel Div....609, 10
Dick Co., A. B....826, 27
Dresser Mfg. Co., S. R....701, 2, 3
Dun-Rite Clock Device Co....310
Duo-Tor Mfg. Co....211
Economy Governor Co....622
Electric Indicator Corp....400
Electrolux Refrigerator Sales, Inc ....530, 31; 614, 15
Elliott Addressing Machine Co...828, 29
Ensign-Reynolds, Inc....606
Eriez Stove & Mfg. Co....710, 711
Estate Stove Co....427, 28; 511
Felt & Tarrant....825
Fisher Governor Co., Inc....620
Floyd-Wells Co....808
Fox Furnace Co....815
Foxboro Co., Inc....205, 6
Frigidaire Corp....837, 8, 9
Fuller & Warren Co....220, 1, 2
Gas Machinery Co....402
Gas Purifying Materials Co....621
General Ceramics Co....118
General Coal Co....133
General Gas Light Co...732, 3, 4, 5, 6, 7
Gestetner-Duplicator Corp....26; 32
Giant Mfg. Co....132
Glenwood Range Co....512, 13
Groble Gas Regulator Co....731
Guardian Gas Appliance Co....234, 5, 6
Harper-Wyman Mfg. Co....627
Heating & Ventilating....141
Hill, Hubbell & Co....300
Hoffman Heater Co....321, 2, 3
Homestead Heater Co....111
Hones, Inc., Charles A....114
Hotstream Heater Co....232
Humphrey Co....333
Hurley Machine Co....242
Improved Equipment-Russell Engineering Corp. ....15
Inertol Co....12
International Business Machines 616; 700
Isbell-Porter Co....706
Johns-Manville, Inc....630, 31
Johnson Gas Appliance Co....722
Judelson Dryer Corp....238, 39
Kelly, Inc., John G....316
Kernit Incinerator Co....308, 9
Kompak Co....836
Koppers Co....518
Lambert Meter Co....228
Lamneck Co., W. E....628
Lattimer Stevens Co....207
Lavino & Co., E. J....601
Linde Air Products Co....730
Lindemann & Hoverson Co., A. J. 715, 16
Littleford Bros....102
Lovekin Water Heater Co....639
Maehler Co., Paul....717, 18
Majestic Mfg. Co....117
McEverlast, Inc....100, 101
McWane Cast Iron Pipe Co....603
Mears-Kane-Ofeldt, Inc....415
Merco Nordstrom Valve Co....835
Milwaukee Gas Specialty Co....527
Minneapolis-Honeywell Regulator Co. ....429, 30
Minwool Insulating Co....135
Mohawk Asphalt Heater Co....623
Moore Brothers Co....313
Mueller Co....401
Mueller Furnace Co., L. J....738, 39, 40
Mulcare Engineering Co....707
National Lead Co....727
National Tube Co....303, 4, 5, 6, 7
Ohio Foundry & Mfg. Co....210
Partlow Corp....339
Patrol Valve Co....412
Peerless Heater Co....139
Peerless Mfg. Co....741, 42
Peninsular Stove Co....714
Pennsylvania Furnace & Iron Co. 216, 17
Perco-Steril Machine Corp....246
Permutit Co....419
Philfuels Co....416, 17
Pittsburgh Coal Co....103
Pittsburgh-Des Moines Steel Co....726
Pittsburgh Equitable Meter Co. ....225, 26; 301, 2
Pittsburg Water Heater Co...522, 23, 24
Porcelain Enamel & Mfg. Co....233
Public Service Electric & Gas Co....20
Ray-Glo Corp....136
Remington Rand, Inc....21, 22; 27, 28
Reynolds Gas Regulator Co....504, 5
Richmond Radiator Co....712
Robbins Publishing Co....500

Roberts & Mander Stove Co.....422, 23
Roberts Brass Mfg. Co.....334
Roberts-Gordon Appliance Corp...208, 9
Robertshaw Thermostat Co.....708, 9
Roots Co., P. H. & F. M.....604
Roper Corp., Geo. D.....431; 515
Rudy Furnace Co.....637, 38
Ruud Manufacturing Co.....406, 7, 8
Safety Gas Lighter Co.....813
Safety Gas Main Stopper Co.....110
Sands Mfg. Co.....426
Savory, Inc.....137, 38
Selas Co.....747
Semet-Solvay Engineering Corp.....326
Sherwin-Williams Co.....127
Slattery & Bro., J. B.....746
Smith Mfg. Co., A. P.....230
Spencer Thermostat Co.....212, 13
Sprague Meter Co.....420
Stacey Bros. Gas Construction Co....605
Stacey Mfg. Co.....602
Standard Gas Equipment Corp.
.....335, 6, 7, 8
Stat-Amatic Instrument & Appliance Co. .....636
Superior Meter Co.....231
Superior Screw & Bolt Mfg. Co.....719
Surface Combustion Co....317, 18, 19, 20
Sweet & Doyle Foundry & Machine Co.
.....841, 42
Tappan Stove Co.....330, 31, 32
Time-O-Stat Controls Co.....528, 29
Underwood-Elliott Fisher Co...516; 600
United Engineers & Constructors, Inc.
.....502, 3
United States Pipe & Foundry Co.....501
Universal Sand Equipment Co.....418
Utilities Publication Co.....725
Utilities Publication Committee.....131
Victaulic Company of America..618, 19
Wailes Dove-Hermiston Corp.....521
Walker & Pratt Mfg. Co.....410
Watts Regulator Co.....315
Welsbach Co.....112
Western Gas Construction Co.....519
West Gas Improvement Co.....14
Wilcolator Company.....409
Wood & Co., R. D.....421
Youngstown Pressed Steel Co.....626

## A Modern Homes Exposition

(Continued from page 245)

secured. It is estimated by the management that in the gas section of the exposition at least $50,000 worth of business was or will have been done, whereas, from the exposition as a whole about $1,000,000 worth of business is expected.

Some 116,000 persons passed through the terminals of the exposition during its progress of which about 20 per cent represented paid admissions. During certain periods the crowds were so great as to entirely fill many of the gas booths.

The enterprise is particularly interesting because it represents a new development of home expositions not at this time, however, entirely representative in its scope, which should undoubtedly include interior furnishings, bathroom fixtures, kitchen utensil equipment, hangings, garden layouts, household hardware, etc., etc. The purpose would be in short, to provide an optical and spectacular view of all of the possible ramifications of home building or remodelling.

A very considerable amount of publicity was obtained in this exposition, less than half of which represented paid lineage.

The gas industry participants in the Modern Homes Exposition included the following gas companies:

Old Colony Gas Company, Arlington Gas Light Company, Charlestown Gas & Electric Company, Malden & Melrose Gas Light Company, Cambridge Gas Light Company, Boston Consolidated Gas Company, Suburban Gas Light Company, Lynn Gas & Electric Company.

Appliance Manufacturers—American Stove Company, Kompak Water Heater Company, Standard Gas Equipment Corporation, Chester Chambers Corporation, Glenwood Range Company, Tufts Meter Works, Walker & Pratt Manufacturing Company, Eastern Service Company, Hoffman Heater Company, Roper Range Company, Kernit Incinerator Company, American Gas Products Company, Welsbach Water Heater Company, Clow Gasteam Heating Company, Fuel Light Company and the Beckwith Company.

## Domestic Gas Appliance Course

(Continued from page 248)

FRIDAY, JUNE 20

9:00-10:00—Clothes Dryers—Laboratory Engineers.

10:00-11:00—Industrial Gas Appliances—E. D. Milener, Industrial Research Representative, American Gas Association.

2:00- 3:00—Increasing the Percentage of Customer Contacts—Miss Ruth Soule, Home Service Director, Brooklyn Union Gas Company.

3:00- 4:00—Testing and Inspection Procedure of the A. G. A. Testing Laboratory—W. M. Couzens, Chief Inspector, A. G. A. Testing Laboratory.

4:00- 4:30—Refrigerators—Laboratory Engineers.

SATURDAY, JUNE 21

9:00-10:00—Organization and Function of a Home Service Department—Miss Ada Bessie Swann, Home Service Director, Public Service Electric & Gas Corporation of New Jersey.

10:00-11:00—Chimney Conditions—J. Corsiglia, Chief Engineer, A. G. A. Testing Laboratory.

11:00-12:00—Résumé of Course—N. J. Reiff.

## Apartment Houses Turn to Gas Refrigerators

THE installation of automatic refrigerators in many of New York's apartment houses that were erected from five to ten or more years ago is enabling these buildings to compete with the more recently completed dwellings, according to N. T. Sellman, director of sales and utilization for the Consolidated Gas Company of New York.

While the modernizing of individual dwellings usually involves extensive remodeling, that of apartment houses is a much simpler matter, since the installation of automatic refrigerators is often the only necessary addition, Mr. Sellman says.

"People looking for new apartments this spring are insisting on automatic refrigeration," he stated. "This is shown by the fact that sales of automatic refrigerators for installation in other than new apartment houses are mounting rapidly. In 1929 orders for about 11,000 automatic gas refrigerators were received by us for this type of building, or slightly more than 50 per cent of the gas refrigerators sold during the year.

"A further increase in this business is anticipated for 1930, when it is expected that at least 18,000 gas refrigerators will be installed in other than new apartments in the gas company's territory."

During the month of February, 1930, 2,310 gas refrigerators were sold by the company, and of which 1,055, or 45 per cent, were for the older apartment houses. This compares with 490 refrigerators sold in the same month in 1929.

## Oklahoma Natural to Pipe Gas From Quinton

GAS reserves of the Quinton field and other sections of Southeastern Oklahoma will be made available to the main transmission line system of the Oklahoma Natural Gas Corporation by construction of a large natural gas transmission line to the Quinton field, according to an announcement made at Tulsa by Thomas R. Weymouth, president of the company.

The line will cost in excess of $1,000,000 and will connect with present Oklahoma Natural gas lines at Muskogee and other points.

# Monthly Summary of Gas Company Statistics

## FOR MONTH OF MARCH, 1930

Issued May, 1930, by the Statistical Department of the American Gas Association
420 Lexington Avenue, New York, N. Y.

PAUL RYAN, Statistician

### COMPARATIVE STATISTICS OF 147 MANUFACTURED GAS COMPANIES FOR MONTH OF MARCH, 1930

| | *Month of March* | | | *Three Months Ending March 31* | | |
|---|---|---|---|---|---|---|
| | *1930* | *1929* | *Per cent Increase* | *1930* | *1929 See March* | *Per cent Increase* |
| Customers | 8,863,507 | 8,669,138 | 2.2 | | | |
| Gas Sales (MCF) | 31,252,084 | 30,658,742 | 1.9 | 97,233,300 | 95,064,667 | 2.3 |
| Revenue (Dollars) | 32,777,760 | 32,270,728 | 1.6 | 101,673,100 | 100,167,746 | 1.5 |
| *Gas Produced and Purchased (MCF)* | | | | | | |
| *Gas Produced* | | | | | | |
| (a) Water Gas | 17,654,333 | 17,412,865 | 1.4 | 53,201,958 | 56,516,465 | — 5.9 |
| (b) Coal Gas | 2,735,535 | 2,660,862 | 2.8 | 8,038,431 | 8,172,143 | — 1.6 |
| (c) Oil Gas | 700,941 | 780,028 | —10.4 | 2,552,134 | 2,606,727 | — 2.1 |
| (d) Coke Oven Gas | 4,076,070 | 3,925,616 | 3.8 | 12,005,542 | 11,394,189 | 5.3 |
| (e) Reformed Oil Still Gas | 157,692 | —— | — | 456,615 | —— | — |
| (f) Total Gas Produced | 25,324,571 | 24,779,371 | 2.2 | 76,254,680 | 78,689,524 | — 3.1 |
| *Gas Purchased* | | | | | | |
| (a) Coke Oven Gas | 9,686,348 | 8,759,084 | 10.6 | 28,654,531 | 24,474,555 | 17.1 |
| (b) Oil Still and Natural Gas | 262,297 | 266,821 | — 1.7 | 797,394 | 844,848 | — 5.6 |
| (c) Total Gas Purchased | 9,948,645 | 9,025,905 | 10.2 | 29,451,925 | 25,319,403 | 16.3 |
| Total Gas Produced and Purchased | 35,273,216 | 33,805,276 | 4.3 | 105,706,605 | 104,008,927 | 1.5 |

### COMPARATIVE STATISTICS OF 82 NATURAL GAS COMPANIES FOR MONTH OF MARCH

| | | | | | | |
|---|---|---|---|---|---|---|
| *Customers* | | | | | | |
| Domestic (Including Househeating) | 3,277,785 | 3,202,850 | 2.3 | | | |
| Commercial | 169,823 | 163,296 | 4.0 | | | |
| Industrial | 9,551 | 8,538 | 11.9 | | | |
| Main Line | 1,398 | 1,112 | 26.2 | | *See March* | |
| Miscellaneous | 890 | 1,090 | — | | | |
| Total (77 Companies which segregate) | 3,459,447 | 3,376,886 | 2.5 | | | |
| Grand Total (82 Companies) | 3,485,294 | 3,401,490 | 2.5 | | | |
| *Gas Sales (MCF)* | | | | | | |
| Domestic (Including Househeating) | 21,942,113 | 22,876,290 | — 4.1 | 73,173,423 | 76,318,778 | — 4.1 |
| Commercial | 3,152,525 | 3,498,923 | — 9.9 | 10,585,506 | 10,805,918 | — 2.0 |
| Industrial | 10,487,512 | 11,663,608 | —10.1 | 33,049,374 | 34,886,608 | — 5.3 |
| Main Line | 60,906 | 54,625 | 11.5 | 174,665 | 191,686 | — 8.9 |
| Miscellaneous | 41,328 | 45,546 | — | 117,049 | 265,973 | — |
| Total (77 Companies which segregate) | 35,684,384 | 38,138,992 | — 6.4 | 117,100,017 | 122,468,963 | — 4.4 |
| Grand Total (82 Companies) | 36,031,222 | 38,493,300 | — 6.4 | 118,355,260 | 123,779,935 | — 4.4 |
| *Revenue (Dollars)* | | | | | | |
| Domestic (Including Househeating) | 14,516,532 | 15,007,244 | — 3.3 | 48,105,746 | 49,778,138 | — 3.4 |
| Commercial | 1,726,653 | 1,754,922 | — 1.6 | 5,775,294 | 5,769,398 | 0.1 |
| Industrial | 3,170,912 | 3,594,996 | —11.8 | 9,723,130 | 10,684,207 | — 9.0 |
| Main Line | 18,173 | 14,830 | 22.5 | 50,119 | 50,768 | — 1.3 |
| Miscellaneous | 61,050 | 53,040 | — | 123,892 | 177,272 | — |
| Total (77 Companies which segregate) | 19,493,320 | 20,425,032 | — 4.6 | 63,778,181 | 66,459,783 | — 4.0 |
| Grand Total (82 Companies) | 19,681,235 | 20,603,408 | — 4.6 | 64,412,174 | 67,107,170 | — 4.0 |
| *Gas Produced and Purchased (MCF)* | | | | | | |
| Natural Gas Produced | 10,947,178 | 11,543,276 | — 5.2 | 36,825,609 | 39,523,629 | — 6.8 |
| Natural Gas Purchased | 37,714,046 | 36,332,968 | 3.8 | 119,168,101 | 118,482,673 | 0.6 |
| Natural Gas Produced and Purchased | 48,661,224 | 47,876,244 | 1.6 | 155,993,710 | 158,006,302 | — 1.3 |
| Manufactured Gas Produced and Purchased | 2,024,433 | 3,579,013 | —43.4 | 6,706,722 | 11,630,131 | —42.3 |
| Total Gas Produced and Purchased | 50,685,657 | 51,455,257 | — 1.5 | 162,700,432 | 169,636,433 | — 4.1 |
| Company Use and Sales to other Gas Companies | 11,816,630 | 12,288,158 | — | 36,395,807 | 38,117,324 | — |
| Net Available for Public Distribution | 38,869,027 | 39,167,099 | — 0.8 | 126,304,625 | 131,519,109 | — 4.0 |

NOTE: Of the eighty-two reporting companies, seventy-seven segregate customers, sales and revenue, while five companies report only totals. The data shown for the domestic, commercial, industrial and main line classifications are based only on the reports of the seventy-seven companies which segregate items.

THE generally depressed state of business and industry during the first quarter of 1930, together with unusually mild weather conditions prevalent throughout most sections of the country, combined to affect the operations of the gas industry during this period.

According to returns from companies representing nearly 90 per cent of the manufactured gas division of the industry, sales for the first quarter aggregated 97,233,000,000 cu.ft. or an increase of 2.3 per cent from the corresponding period of the preceding year. This is considerably less than the usual year to year increased experienced by the manufactured gas part of the industry.

A group of the larger natural gas companies, representing approximately 60 per cent of the public utility distribution of natural gas, report sales of 118,355,260,000 cu.ft. for the first quarter of 1930, as compared with 123,779,935,000 cu.ft. sold by the same companies in the first three months of 1929, a decrease of 4.4 per cent in sales of natural gas.

Such data should, however, be viewed in conjunction with the decline in general industrial and economic activity during the quarter, the magnitude of which may be partially indicated by data on pig iron production, which declined 14 per cent from the first quarter of 1929, or the volume of building contracts awarded, showing a drop of more than 12 per cent, and decreases of 10 per cent in bituminous coal production, 7 per cent in freight car loadings, 33 per cent in the production of passenger automobiles and a decline of 10 per cent in bank debits outside of New York City.

These factors are reflected in a decrease of more than 5 per cent in natural gas sales for industrial purposes, with corresponding declines in the same class of manufactured gas sales, as indicated by a decrease of over 11 per cent for industrial sales in Massachusetts, with industrial sales for New England as a whole showing a drop of nearly 6 per cent. In Indiana industrial sales were down nearly 3 per cent, in Michigan over 5 per cent, and Wisconsin nearly 1 per cent. Illinois was one of the few states to register a gain in industrial sales of manufactured gas for the quarter, the increase amounting to 4.4 per cent over the same period of 1929.

The decline of some 4 per cent in sales of natural gas for domestic purposes may be attributed in large part to the unusually mild weather prevalent throughout most sections of the country during the first quarter of 1930, as an appreciable proportion of the domestic consumption of natural gas is devoted to househeating purposes, and is, therefore, greatly affected by climatic and weather conditions.

## GROUP A—NEW ENGLAND STATES

*(Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.)*

(Data reported by 36 companies whose sales constitute approximately 82% of the total sales of gas in the New England States.)

| | *Month of March* | | | *Three Months Ending March 31* | | |
|---|---|---|---|---|---|---|
| | *1930* | *1929* | *Per cent Increase* | *1930* | *1929* | *Per cent Increase* |
| ***Customers*** | | | | | | |
| Domestic | 1,039,854 | 1,033,147 | 0.6 | | | |
| Househeating | 5,563 | 3,969 | 40.2 | | | |
| Industrial and Commercial | 37,368 | 38,734 | — 3.5 | | *See March* | |
| Miscellaneous | 400 | 207 | — | | | |
| Total (35 companies which segregate) | 1,083,185 | 1,076,057 | 0.7 | | | |
| Grand Total (36 companies) | 1,116,845 | 1,109,332 | 0.7 | | | |
| ***Gas Sales (MCF)*** | | | | | | |
| Domestic | 2,078,912 | 1,988,345 | 4.5 | 6,456,656 | 6,266,123 | 3.0 |
| Househeating | 420,801 | 301,795 | 39.4 | 1,432,421 | 1,057,360 | 35.5 |
| Industrial and Commercial | 560,493 | 609,785 | — 8.1 | 1,691,939 | 1,793,287 | — 5.7 |
| Miscellaneous | 29,429 | 28,642 | — | 90,422 | 89,372 | — |
| Total (35 companies which segregate) | 3,089,635 | 2,928,567 | 5.4 | 9,671,438 | 9,205,842 | 5.1 |
| Grand Total (36 companies) | 3,183,130 | 3,012,769 | 5.7 | 9,959,827 | 9,472,375 | 5.2 |
| ***Revenue (Dollars)*** | | | | | | |
| Domestic | 2,732,059 | 2,611,633 | 4.6 | 8,419,463 | 8,163,286 | 3.1 |
| Househeating | 341,317 | 244,840 | 39.4 | 1,153,938 | 847,163 | 36.2 |
| Industrial and Commercial | 528,603 | 616,193 | —14.1 | 1,614,990 | 1,830,456 | —11.8 |
| Miscellaneous | 18,652 | 21,912 | — | 56,776 | 65,770 | — |
| Total (35 companies which segregate) | 3,620,631 | 3,494,578 | 3.6 | 11,245,167 | 10,906,675 | 3.1 |
| Grand Total (36 companies) | 3,722,725 | 3,587,769 | 3.8 | 11,553,308 | 11,201,226 | 3.1 |
| ***Gas Produced and Purchased (MCF)*** | | | | | | |
| *Gas Produced* | | | | | | |
| (a) Water Gas | 1,556,121 | 1,498,845 | 3.8 | 4,787,349 | 4,751,795 | 0.8 |
| (b) Coal Gas | 818,219 | 758,556 | 7.9 | 2,419,998 | 2,227,008 | 8.7 |
| (c) Oil Gas | —— | —— | — | 438 | —— | — |
| (d) Coke Oven Gas | 378,293 | 300,271 | 26.0 | 1,113,881 | 864,891 | 28.8 |
| (e) Total Gas Produced | 2,752,633 | 2,557,672 | 7.6 | 8,321,666 | 7,843,694 | 6.1 |
| Coke Oven Gas Purchased | 755,397 | 703,821 | 7.3 | 2,194,983 | 2,076,607 | 5.7 |
| Total Gas Produced and Purchased | 3,508,030 | 3,261,493 | 7.5 | 10,516,649 | 9,920,301 | 6.0 |

NOTE: Of the thirty-six reporting companies, thirty-five segregate customers, sales and revenue while one company reports only totals. The data shown for the domestic, househeating and industrial-commercial classifications are based only on the reports of the thirty-five companies which segregate items.

## Three Doctor's Degrees in Gas Engineering

(Continued from page 251)

Light & Coke Company, Chicago, Ill.; Petersburg Gas Company, Petersburg, Va.; Providence Gas Company, Providence, R. I.; Public Service Company of Northern Illinois, Chicago, Ill.; The Robbins Publications, New York, N. Y.; George D. Roper Corporation, Rockford, Ill.; Safety Gas Main Stopper Company, Brooklyn, N. Y.; Southern Cities Utilities Company, Philadelphia, Pa.; The Sprague Meter Company, Bridgeport, Conn.; Standard Gas Equipment Corporation, New York, N. Y.; Superior Meter Company, Brooklyn, N. Y., and the Washington Gas Light Company, Washington, D. C.

Personal subscribers to the Course are as follows:

Charles M. Cohn, Baltimore, Md.; H. R. Cook, Jr., Baltimore, Md.; Alexander Forward, New York, N. Y.; Edward L. Rieha, Jr., Baltimore, Md., and W. H. Taylor, Philadelphia, Pa.

Without the generous support of these donors, The Johns Hopkins University Gas Engineering Course could not have continued, and the creative work represented by the dissertations submitted in candidacy for the doctor's degree would not have been possible.

The personnel of the Advisory Board to the department is as follows:

Walter R. Addicks, chairman, Senior Vice-President, The Consolidated Gas Company of New York; Charles M. Cohn, secretary, Vice-President, Consolidated Gas Electric Light & Power Company of Baltimore; Howard Bruce, Chairman of Board, Bartlett-Hayward Company, Baltimore; Philip H. Gadsden, Vice-President, The United Gas Improvement Company, Philadelphia; L. Irving Pollitt, President, Southern Gas & Electric Corporation; Henry B. Rust, President, The Koppers Company, Pittsburgh, and H. S. Schutt, Vice-President and General Manager, The C. H. Geist Company, Philadelphia.

High school graduates who are planning to enter engineering schools in September, 1930, will be interested to know that Johns Hopkins offers this course in gas engineering. The curriculum in gas engineering provides for instruction and research in the fundamental scientific and technical principles which underlie the gas and fuel industries. The instruction is designed to equip a student for service not only in these but also in many other fields which involve both engineering and chemistry. Upon the satisfactory completion of the course the degree, Bachelor of Engineering, is awarded.

Students entering this course generally have opportunities to secure summer employment and experience in gas and fuel industries, thereby earning a portion of their expenses and simultaneously gaining credit in the course.

Information concerning the course, scholarships, tuition, and employment opportunities can be obtained from the School of Engineering, The Johns Hopkins University, Baltimore, Maryland, or from the Consolidated Gas Electric Light and Power Company of Baltimore.

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## Short Course in Gas Engineering at U. of I.

(Continued from page 259)

FRIDAY, JUNE 20

8:00-10:00—Competitive Fuels: Problems—Prof. D. B. Keyes, Department of Chemistry, University of Illinois.

10:00-12:00—Soft Metal Melting and Brass Melting—W. J. Barenshear, American Gas Furnace Company.

1:00- 3:00—Soft Metal Melting and Brass Melting (Cont'd)—W. J. Barenshear, American Gas Furnace Company.

3:00- 5:00—Economics of Load Building—(To Be Announced).

SATURDAY, JUNE 21

8:00-10:00—Distribution Systems and Meters—M. I. Mix, Superintendent of Distribution, The Peoples Gas Light and Coke Company.

MONDAY, JUNE 23

8:00-10:00—Low Temperature Industrial Heating Applications—W. A. Darrah, President, Continental Industrial Engineers.

10:00-12:00—Analysis of Industrial Heating Problems—W. A. Darrah, President, Continental Industrial Engineers.

1:00- 3:00—Introductions to Fluid & Heat Flow Calculations—Prof. D. B. Keyes, Department of Chemistry, University of Illinois.

3:00- 5:00—Volume Water Heating—C. H. Light, Manager of Water Heating Division, Peoples Light and Coke Company.

TUESDAY, JUNE 24

8:00-10:00—Problems in Flour Products—M. R. Resser, Food Specialist, Surface Combustion Company.

10:00-12:00—Hotel and Restaurant Applications—T. J. Gallagher, Manager of Hotel and Restaurant Division, The Peoples Gas Light and Coke Company.

1:00- 3:00—Hotel and Restaurant Applications (Cont'd)—T. J. Gallagher, Manager of Hotel and Restaurant Division, The Peoples Gas Light and Coke Company.

3:00- 5:00—Advertising Industrial Gas—A. B. Greenleaf, Editor of *Industrial Power*.

WEDNESDAY, JUNE 25

8:00-10:00—Insulation—Prof. A. P. Kratz, Department of Mechanical Engineering, University of Illinois.

10:00-12:00—House Heating Estimating—Glen G. Carnahan, Manager, Furnace Division, James B. Clow and Company.

1:00- 3:00—House Heating Estimating (Cont'd)—Glen G. Carnahan, Manager, Furnace Division, James B. Clow and Company.

3:00- 5:00—Warm Air Heating Systems—V. S. Day, Chief Engineer, Carrier-Lyle Corporation.

THURSDAY, JUNE 26

8:00-12:00—Hot Water and Steam Heating Systems—W. E. Stark, Bryant Heater and Manufacturing Company.

1:00- 3:00—Servicing Gas Fired Heating Equipment—H. B. Johns, Manager, Heating Division, The Peoples Gas Light and Coke Company.

6:30—Banquet — Arrangements to be completed.

FRIDAY, JUNE 27

8:00-10:00—Refrigeration—H. C. Wandas, Assistant Manager, Refrigeration Department, The Peoples Gas Light and Coke Company.

10:00-12:00—Engineering Aspects of Selling House Heating—E. J. Opal, Bryant Heater and Manufacturing Company.

1:00- 3:00—Engineering Aspects of Selling House Heating (Cont'd)—E. J. Opal, Bryant Heater and Manufacturing Company.

3.00- 5:00—Review of Course.

SATURDAY, JUNE 28

8:00-12:00—Final Examination.

# Associations Affiliated with A. G. A.

**Canadian Gas Association**
Pres.—Kenneth L. Dawson, Nova Scotia Light & Power Co., Ltd., Halifax, N. S.
Sec.-Tr.—G. W. Allen, 21 Astley Avenue, Toronto.

**Colorado Utilities Association**
Pres.—H. S. Robertson, Denver Tramway Corp., Denver, Colo.
Sec.-Tr.—O. A. Weller, Public Service Co. of Colo., Denver, Colo.

**Empire State Gas and Electric Association**
Pres.—William J. Welsh, New York & Richmond Gas Co., Staten Island, New York.
Chairman Gas Section—M. F. Clement, Rockland Light & Power Co., Middletown, Ind.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.

**Illinois Gas Association**
Pres.—H. T. East, Public Service Company of Northern Illinois, Chicago, Ill.
Sec.-Tr.—George Schwaner, 305 Illinois Mine Workers Bldg., Springfield, Ill.

**Indiana Gas Association**
Pres.—C. L. Kirk, Citizens Gas Co., Indianapolis, Ind.
Sec.-Tr.—F. W. Budd, Central Indiana Gas Co., Muncie, Ind.

**Michigan Gas Association**
Pres.—A. I. Snyder, Detroit City Gas Co., Detroit, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.

**Mid-West Gas Association**
Pres.—J. M. Drabelle, Iowa Ry. & Lt. Corp., Cedar Rapids, Iowa.
Sec.-Tr.—Roy B. Searing, Sioux City Gas & Electric Co., Sioux City, Iowa.

**Missouri Association of Public Utilities**
Pres.—H. M. Patton, Union Electric Light & Power Co., St. Louis, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Asst. Sec.—Jesse Blythe, 103 West High St., Jefferson City, Mo.

**New England Gas Association**
Pres.—H. Vittinghoff, Stone & Webster, Inc., Boston, Mass.
Exec. Sec.—C. D. Williams, 41 Mount Vernon St., Boston, Mass.
Chairman Operating Div.—A. S. Hall, Springfield Gas Light Co., Springfield, Mass.
Secretary Operating Division—Paul Buchanan, Hartford Gas Co., Hartford, Conn.
Chairman Sales Div.—J. H. Sumner, Cambridge Gas Light Co., Cambridge, Mass.
Sec.-Tr. Sales Div.—A. M. Slattery, Hoffman Heater Co., Boston, Mass.
Chairman Industrial Div.—L. E. Wagner, Providence Gas Co., Providence, R. I.
Sec.-Tr.—Industrial Div.—Charles S. Hilton, Pawtucket Gas Co., Pawtucket, R. I.
Chairman Acctg. Div.—Burton Smart, Portland Gas Light Co., Portland, Me.
Sec.-Treas. Acctg. Div.—Otto Price, Boston Consolidated Gas Co., Boston, Mass.
Chairman Manufacturer Div.—J. D. Taylor, Walker & Pratt Mfg. Co., Boston, Mass.
Sec.-Treas. Manufacturers Div.—J. H. McPherson, 250 Stuart St., Boston, Mass.

**New Jersey Gas Association**
Pres.—Chester Grey, Atlantic City Gas Company, Atlantic City, N. J.
Sec.-Tr.—H. E. Cliff, Public Service Electric & Gas Co., Newark, N. J.

**Ohio Gas and Oil Men's Association**
Pres.—L. K. Langdon, Union Gas & Electric Co., Cincinnati, Ohio.
Sec.-Tr.—Wm. H. Thompson, 811 First National Bank Bldg., Columbus, Ohio.

**Oklahoma Utilities Association**
Pres.—T. H. Steffens, Sand Springs Railway Co., Sand Springs, Okla.
Mgr.—E. F. McKay, 1020 Petroleum Bldg., Oklahoma City, Okla.

**Pacific Coast Gas Association**
Pres.—F. H. Bivens, Southern Counties Gas Co., Los Angeles, Calif.
Mang. Dir.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.

**Pennsylvania Gas Association**
Pres.—E. G. Boyer, Philadelphia Electric Co., Philadelphia, Pa.
Sec.-Tr.—Frank W. Lesley, Pennsylvania Gas & Electric Co., York, Pa.

**Pennsylvania Natural Gas Men's Association**
Pres.—Geo. E. Whitwell, Equitable Gas Co., Pittsburgh, Pa.
Sec.-Tr.—B. H. Smyers, Jr., 435 Sixth Ave., Pittsburgh, Pa.

**Southern Gas Association**
Pres.—D. H. Levan, Jacksonville Gas Co., Jacksonville, Fla.
Sec.-Tr.—G. H. Schlatter, Birmingham Gas Co., Birmingham, Ala.

**Southwestern Public Service Association**
Pres.—Knox Lee, Southwestern Gas & Electric Co., Marshall, Texas.
Chairman Gas Section—Frank L. Chase, Lone Star Gas Co., Dallas, Texas.
Sec.—E. N. Willis, c/o University Club, Dallas, Texas.

**The Public Utilities Association of Virginia**
Pres.—C. B. Short, Roanoke Railway and Electric Co., Roanoke, Va.
Sec.— C. O. Robertson, P. O. Box 537, Roanoke, Va.

**Wisconsin Utilities Association**
Pres.—M. H. Frank, Wisconsin Power & Light Co., Madison, Wis.
Exec. Sec.—J. N. Cadby, 105 Wells St., Milwaukee, Wis.

Twelfth Annual Convention of the American Gas Association
Atlantic City, N. J. - - - October 13-17, 1930

# Employment Bureau

## SERVICES REQUIRED

Sales Engineer wanted by large public utility in the Middle West. Experienced in commercial and residential heating. Must be a high school graduate. College graduate from an engineering course preferred. Permanent position. Please state age, experience, education and salary expected. **0158.**

Experienced industrial gas salesmen for large operating gas company. **0163.**

Salesmen to sell gas to industries. Experienced men preferred. **0164.**

Sales engineers to handle line of motor operated valves, low temperature pressure and combustion safety controllers. Men 25 to 35 years with college training preferred. Familiarity with process control field advantageous. **0167.**

Practical industrial gas engineer experienced in erection and installation of burners and furnaces in industrial plants, capable of developing a new field. About 30 years of age and good personality. Not a high pressure orator, but rather of the type generally accepted as convincing, having a good mind for calculation and appreciating the opinions of others. Salary to start $200 to $250. **0168.**

Industrial gas sales engineers by Public Utility in Middle West. College graduates in engineering courses preferred. Please state age, experience, education, and salary expected. **0169.**

Supervising engineer for large organization with experience in natural gas work and preferably also in valuation and rate-making. Splendid opportunity for right man. **0170.**

One, two or three salesmen familiar with housheating; would like to interview those who have held similar positions with gas companies. Salary according to experience and ability. **0171.**

Experienced gas appliance salesmen wanted by Holding Company for service in small gas plants. Only men who can sell and are ambitious are desired. Salary and commission. Write full qualifications. **0172.**

Young engineer to supervise servicing of heating boilers, gas refrigerators, water heaters and similar appliances; a technical man who can learn the practical end or who is already familiar with it, and who also will understand the theory of the gas refrigerator, etc. **0173.**

## SERVICES OFFERED

Executive with successful organizing and technical experience wants to make a change. **316.**

Successful industrial engineer of several years broad experience; also technically trained in production and distribution; college graduate. **317.**

Industrial sales engineer, 33, with managerial sales experience in natural, manufactured and mixed gas territories. In charge of industrial and commercial departments. Has designed many special furnaces and laid out own installations. Can furnish creditable references from previous employers. Employed at present as commercial manager and desires change to industrial work in Middle West or East. **318.**

Thermal Engineer (M.S.). Long training and experience with industrial gas applications. Familiar with natural and the various manufactured gases and their practical ratings. Desirable expert advisor to industrial gas sales division, and as organizer and director of fuel economics for heavy industrial consumers. Recognized authority on Combustion. Familiar with utility problems affecting sales conditions. Able to promote and direct practical testing and development to extend the use of gas, especially as chemical manufacturing material. **319.**

Gas Engineer with technical education and over fifteen years' experience in the design, construction and operation of all types of coal carbonizing plants desires to make a connection where training and experience can be used to advantage. **320.**

Gas Sales Executive, now completing a successful three years' load building program of a large Middle West Natural Gas Company. Capable sales executive and organizer with a technical and legal training. **322.**

### CONFIDENTIAL SERVICE

A confidential service available to members, whereby those seeking men and those seeking positions may be brought together; a part of A.G.A. service to which all members are entitled, without charge, any time they choose to avail themselves of it. For those who may not desire to advertise, a special qualification form, also confidential, is available, which may be filed for consultation when advising companies seeking the services of executives, engineers, operators, salesmen, and others.

*Typewrite qualification record and letters of application if possible.*

Company and individual advertisers are requested to inform the Employment Bureau immediately a position has been filled or accepted; all advertisements should be received at A.G.A. Headquarters not later than the seventh of the month to insure insertion in the next issue.

Sales Manager with gas and electric company or gas alone. Prefer Connecticut or New York State. Eighteen years' experience. **323.**

Over twenty years of experience with one public utility company in all angles of the gas industry are behind the writer of this advertisement. He has been Constructing and Operating Engineer on both Plant and Distribution work, Sales Manager, Advertising and Publicity Manager and a successful handler of employees and the public. He possesses good health and has the qualities of initiative, versatility, adaptability and promotion of goodwill. His natural talents are executive and managerial. He is not shooting at the stars, but desires a position of responsibility where his experience and wide range of activity will be of value to his employer. **324.**

Available, new business manager or executive's assistant. Age 35. Married. Graduate Engineer, with coal gas and water gas plant experience and successful industrial gas and housheating management experience in large companies. Have had ten year connection in aggressive companies in the gas industry. **325.**

Young man, 32, with eight years experience in number of combination companies, with single firm, desires position of Assistant to Executive. **327.**

Distribution, Plant or General Foreman with medium size or small gas plant. Twenty-five years experience in water gas manufacture and distribution work. Married. Good references. South preferred. **328.**

Manager-Engineer, technical man, nineteen years experience in coal and water gas operation, distribution, city and industrial plant design and construction; familiar with recent developments in production and modification of gases; now employed, desires change. **329.**

Technical and practical gas engineer now employed as manager of small property desires a position as production engineer over a group of properties. Capable of putting gas production and boiler plants on a money saving basis. **330.**

Experienced sales engineer specializing in design and sale of carbonization and auxiliary plant equipment. Good organizer, with analytical ability and wide acquaintance in Canada and United States. **332.**

Gas engineer having wide experience in all departments of business, construction, manufacturing, distribution, sales and appraisal—also knowledge of the sale and handling of by-products, and having executive experience desires connection as manager or superintendent or as engineer with holding company. Could handle combination gas and electric company. Can furnish best of references. **333.**

Industrial and housheating engineer with nineteen years experience in the natural gas industry; capable of compiling manuals and organizing departments with proven results; desires position as such, or manager of small property. **334.**

Technical man, age 34, married. Eleven years experience in laboratory and plant control of coal and water gas manufacture. Open for position as chemist, assistant to superintendent or foreman. **335.**

Chemical Engineer with Master's degree, experienced research man in engineering and public utility problems, desires summer employment. **337.**

Chemical engineer with eight years' experience with large public utilities on gas plant operation, and design of gas and power plant equipment. Experienced in handling men. Desires place as assistant to executive, or industrial sales. Would consider service and sales with equipment manufacturer. Married and now employed. Can leave on short notice. **338.**

A young executive with several years' experience in rates, sales promotion, advertising and public relations work is now available. **339.**

Engineer, M.S. degree, 10 years' experience in coal processing and allied problems. Particular experience in technical and economic phases of low-temperature carbonization and complete gasification. **340.**

Gas Engineer—college education, with nine years' experience in transmission and distribution of manufactured and natural gas. **341.**

Gas sales engineer of broad experience in industrial and housheating fields. Age 29, married. Capable of developing new field, conducting surveys, and designing equipment for special heating processes; familiar with domestic appliances. Desires position as manager of department or assistant to executive. **342.**

Meter shop superintendent with thorough knowledge of all types of meters; can produce results without disorganizing other personnel and offers best of references. **344.**

Engineer—technical graduate with twelve years' experience as cadet engineer, plant foreman, manager and engineer desires new connection—40 years of age, married. **345.**

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